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ANNUAL
AIR QUALITY
REPORT

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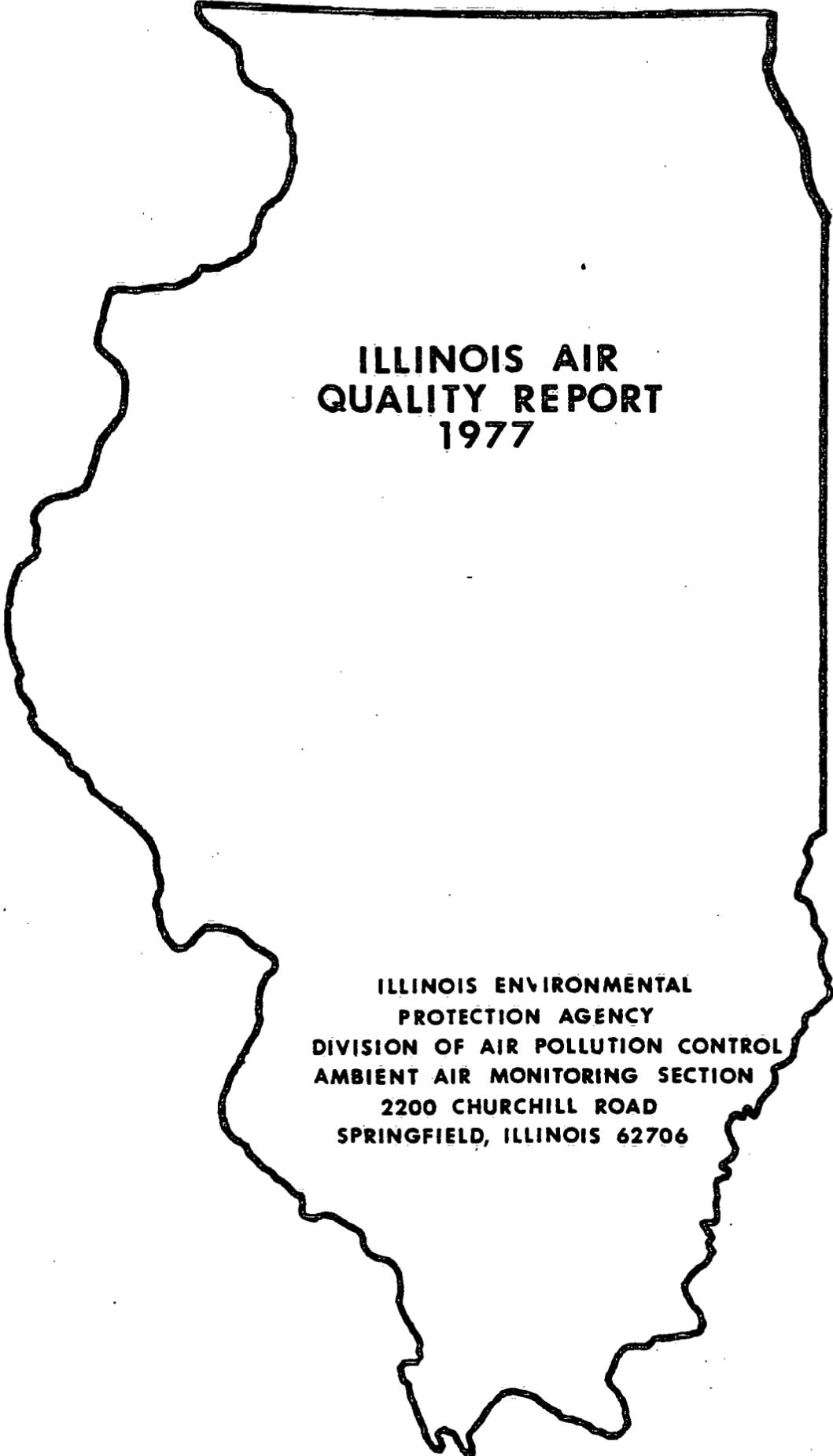
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AIR QUALITY CONTROL REGIONS



AIR QUALITY CONTROL REGIONS

- 68 — Burlington - Keokuk Interstate (Iowa - Illinois)
- 69 — East Central Illinois Interstate
- 67 — Metropolitan Chicago Interstate (Illinois - Indiana)
- 66 — Metropolitan Duquesne Interstate (Iowa - Illinois - Wisconsin)
- 65 — Metropolitan Quad Cities Interstate (Illinois - Iowa)
- 70 — Metropolitan St. Louis Interstate (Illinois - Missouri)
- 71 — North Central Illinois Interstate
- 72 — Paducah - Cairo Interstate (Kentucky - Illinois)
- 73 — Rockford - Janesville - Beloit Interstate (Illinois - Wisconsin)
- 74 — Southeast Illinois Interstate
- 75 — West Central Illinois Interstate



**ILLINOIS AIR
QUALITY REPORT
1977**

**ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
AMBIENT AIR MONITORING SECTION
2200 CHURCHILL ROAD
SPRINGFIELD, ILLINOIS 62706**

FOREWARD

The 1977 Annual Air Quality Report has been prepared using a format similar to previous years. Notable additions to this year's report are a section devoted to industrial data and one presenting metals data. Both of these sections, though new to the report, are expected to expand significantly in the future with increased emphasis in both areas. During calendar year 1978, the industrial data base in Illinois is expected to increase to the point where the number of industrial total suspended particulate sites is equivalent to that in the statewide network, while the number of industrial sulfur dioxide monitors will be three times the number of those operated by the State and local agencies. Data gathered in these industrial networks will aid in the preparation of a more complete profile of air quality in Illinois.

The Illinois Environmental Protection Agency is embarking on a program of analyzing samples from all of its total suspended particulate sites for the metals nickel, iron, zinc, cadmium, lead, arsenic, copper, manganese and chromium. This program, coupled with the Cook County Department of Environmental Control metals analysis effort and that of the City of Chicago, will provide critical data for the major metropolitan areas of the State.

Quality assurance has become a common term in the air monitoring field in recent years. Progress has been made in the refinement of the Illinois Quality Assurance Program to the point where more inspections and audits were made in 1977 than in any previous year. The result of this effort is that more confidence can be placed in the data generated by the monitoring network. Continued emphasis will be placed on this program in the coming year with plans for including several large industrial networks already in the inspection schedule.

Our sincere appreciation is extended to all who have cooperated in the collection of the data contained in this report. This includes the individuals, as well as the Agencies, who have dedicated themselves to the operation of the monitoring network. Of special note here are the industrial concerns who have provided the data presented in Section 6.

We welcome your suggestions, comments and criticisms and have provided a form letter for your convenience.

Copies of this report can be obtained by writing to the Ambient Air Monitoring Section, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706.

David J. Kolaz

David J. Kolaz, P.E.

Manager

Ambient Air Monitoring Section

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CRITERIA FOR DETERMINING VIOLATIONS OF THE AMBIENT AIR QUALITY STANDARDS

TOTAL SUSPENDED PARTICULATE:	Primary Standard: A. For those samples greater than 260 micrograms per cubic meter each 24-hour sample after the first is in violation of the standard. B. Annual Geometric Mean in excess of 75 micrograms per cubic meter. Secondary Standard: A. For those samples greater than 50 micrograms per cubic meter each 24-hour sample after the first is in violation of the standard. B. Annual Geometric Mean in excess of 60 micrograms per cubic meter.
SULFUR DIOXIDE:	Primary Standard: A. For those 24-hour averages in excess of 0.4 parts per million each non-overlapping average after the first is in violation of the standard. B. Annual Arithmetic Mean in excess of .03 parts per million. Secondary Standard: A. For those non-overlapping 3-hour averages in excess of .5 parts per million each average after the first is in violation of the standard.
CARBON MONOXIDE:	Primary Standard (Secondary Standard Same As Primary): A. For those 8-hour averages in excess of 9 parts per million each non-overlapping average after the first is in violation of the standard. B. Each one-hour sample greater than 35 parts per million after the first is in violation of the standard.
PHOTO-CHEMICAL OXIDANT:	Primary Standard (Secondary Standard Same As Primary): A. For those one-hour samples greater than .08 parts per million each sample after the first is in violation of the standard.
NON-METHANE HYDROCARBONS:	Primary Standard (Secondary Standard Same As Primary): A. For those 6-9 a.m. averages greater than .24 parts per million each average after the first is in violation of the standard.
NITROGEN DIOXIDE:	Primary Standard (Secondary Standard Same As Primary): A. Annual Arithmetic Mean in excess of .03 parts per million.

This table may be removed and used as a straight-edge guide in reading the data tables and as a reference for determining violations of the Air Quality Standard.

1.0 AIR QUALITY STANDARDS AND EPISODE LEVELS

The National Ambient Air Quality Standard (NAAQS) currently in effect are shown in Table 1. The Ambient Air Quality Standards, promulgated by the State of Illinois, are identical to the NAAQS. In addition to the Air Quality Standards, episode levels have been established to protect the public from ambient air concentrations which may result from short-term adverse conditions. These levels are shown in Table 2. The following are the Air Quality Standards as adopted by the Illinois Pollution Control Board and which are contained in Chapter 2 of the Illinois Pollution Control Board's Air Pollution Control Regulations.

EXCEPT AS HEREINAFTER STATED AND UNLESS A DIFFERENT MEANING OF A TERM IS CLEAR FROM ITS CONTEXT, THE DEFINITIONS OF TERMS USED IN THIS CHAPTER SHALL BE THE SAME AS THOSE USED IN THE ENVIRONMENTAL PROTECTION ACT.

ALL TERMS DEFINED IN PARTS 1 AND 2 OF THIS CHAPTER WHICH APPEAR IN PART 3 OF THIS CHAPTER HAVE THE DEFINITIONS SPECIFIED BY RULE 101 OF PART 1 OR RULE 201 OF PART 2 OF THIS CHAPTER.

Rule 301: Preamble. Air quality standards are limits on atmospheric concentrations of air contaminants established for the purpose of protecting public health and welfare. The levels of air quality designated by the standards are designed to protect against injury to human, plant or animal life and they are further intended to allow maximum enjoyment of life and property consistent with the intent of the Environmental Protection Act.

The first use of our air resources is to sustain life. Air entering the respiratory tract must not menace health. Therefore, the air quality standards set must, as a minimum, provide air which will not adversely affect, through acute or chronic symptoms, the health of the community. Adverse health effects include not only the possible production and aggravation of disease, but also interference with bodily functions. The standards have also taken into account soiling, corrosion, vegetation damage and other human effects.

The standards are more than goals. They are legally enforceable limitations, and any person causing or contributing to a violation of the standards is subject to enforcement proceedings under the Act. The standards have also been designed for use as a basis for the development of implementation plans by State and local agencies for the abatement and control of pollutant emissions from existing sources, and for the determination of air contaminant emission limitations to ensure that population and economic growth trends do not add to the region's air pollution problems.

Rule 302: Applicability.

The standards in this part are applicable throughout the State of Illinois, except as otherwise in this part provided.

Rule 303: Nondegradation.

Existing ambient air quality which is better than the established ambient air quality standards at the date of their adoption will be maintained in its present high quality. Such ambient air quality shall not be lowered unless and until it is proved to the Agency that such change is justifiable as a result of necessary economic and social development and will not interfere with or become injurious to human health or welfare.

Rule 304: Effective Date.

The standards of this Part 3 shall become effective ten days after such Part is filed with the Secretary of State.

Rule 305: Monitoring.

Pollution levels will be determined by fixed or mobile sampling stations beyond the premises on which a source is located. Stations will be located according to the guidelines for establishing monitoring networks as developed by the National Air Pollution Control Administration.

Rule 306: Reference Conditions.

All measurements of air quality are corrected to a reference temperature of 25°C, and to a reference pressure of 760 millimeters of mercury (1,013.2 millibars).

Rule 307: Particulates.

(a) Standards.

(1) Primary Standards. The primary ambient air quality standards for particulate matter are:

- (A) an annual geometric mean concentration of 75 micrograms per cubic meter; and,
- (B) a maximum 24-hour concentration not to be exceeded more than once per year of 260 micrograms per cubic meter.

(2) Secondary Standards. The secondary ambient air quality standards for particulate matter are:

- (A) an annual geometric mean concentration of 60 micrograms per cubic meter; and,
- (B) a maximum 24-hour concentration not to be exceeded more than once per year of 150 micrograms per cubic meter.

- (b) Measurement Method. For determining conformance with particulate air quality standards, particulate matter shall be measured by the high volume sampler method as described in 36 Federal Register pp. 22388-22390, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 308: Sulfur Oxides (Sulfur Dioxide).

- (a) Primary Standards. The primary ambient air quality standards for sulfur oxides measured as sulfur dioxide are: (A) an annual arithmetic mean concentration of 80 micrograms per cubic meter (0.03 ppm); and (B) a maximum 24-hour concentration not to be exceeded more than once per year of 365 micrograms per cubic meter (0.14 ppm).
- (b) Secondary Standard. The secondary ambient air quality standard for sulfur oxides measured as sulfur dioxide is a maximum 3 hour concentration not to be exceeded more than once per year of 1,300 micrograms per cubic meter (0.5 ppm).
- (c) Measurement Method. For determining conformance with sulfur oxide air quality standards, sulfur oxides shall be measured as sulfur dioxide by the paraosaniline method as described in 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards, Appendix A, or by an equivalent method of proof approved by the Agency.

Rule 309: Non-methane Hydrocarbons.

- (a) Standard. The ambient air quality standard for non-methane hydrocarbons, measured as methane, is 160 micrograms per cubic meter (0.24 ppm) maximum 3-hour concentration (6 to 9 a.m.) not to be exceeded more than once per year.
- (b) Measurement Method. For determining conformance with the non-methane hydrocarbon air quality standard, hydrocarbons shall be measured by the hydrogen flame ionization detector technique as described in 36 Federal Register, pp. 22394-22396, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 310: Carbon Monoxide.

- (a) Standards. The ambient air quality standards for carbon monoxide are:
- (1) a maximum 8-hour concentration not to be exceeded more than once per year of 10 milligrams per cubic meter (9 ppm); and,
 - (2) a maximum 1-hour concentration not to be exceeded more than once per year of 40 milligrams per cubic meter (35 ppm).
- (b) Measurement Method. For determining conformance with the carbon monoxide air quality standard, carbon monoxide shall be measured

by the non-dispersive infrared spectrometry technique as described in 36 Federal Register, pp. 22391-22392, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 311: Nitrogen Dioxide.

- (a) Standards. The ambient air quality standard for nitrogen dioxide is an annual arithmetic mean concentration of 100 micrograms per cubic meter (0.05 ppm).
- (b) Measurement Method. For determining conformance with the nitrogen dioxide air quality standard, nitrogen dioxide shall be measured by the colorimetric method as described in 35 Federal Register, pp. 22396-22397, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 312: Photochemical Oxidants.

- (a) Standard. The ambient air quality standard for photochemical oxidants is 160 micrograms per cubic meter (0.08 ppm) maximum 1-hour concentration not to be exceeded more than once per year.
- (b) Measurement Method. For determining conformance with the photochemical oxidants air quality standard, photochemical oxidants shall be measured by the ozone-ethylene reaction method as described in 36 Federal Register, pp. 22392-22393, November 25, 1971, or by an equivalent method approved by the Agency.

TABLE 1
SUMMARY OF NATIONAL AND ILLINOIS¹
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	TIME OF AVERAGE	PRIMARY STANDARD (AT 25°C and 760 mm of Hg)	SECONDARY STANDARD
PARTICULATE MATTER (TSP)	Annual Geometric Mean 24 hour	75 ug/m ³ 260 ug/m ³	60 ug/m ³ 150 ug/m ³
SULFUR DIOXIDE (SO ₂)	Annual Arithmetic Mean 24 hour 3 hour	0.03 ppm (80 ug/m ³) 0.14 ppm (365 ug/m ³) None	None None 0.5 ppm (1300 ug/m ³)
CARBON MONOXIDE (CO)	8 hour 1 hour	9 ppm (10 mg/m ³) 35 ppm (40 mg/m ³)	Same as Primary Same as Primary
PHOTO-CHEMICAL OXIDANTS (O ₃)	1 hour	0.08 ppm (160 ug/m ³)	Same as Primary
NON-METHANE HYDROCARBONS (N-MHC)	3 hour (6 to 9 AM)	0.24 ppm (160 ug/m ³)	Same as Primary
NITROGEN DIOXIDE (NO ₂)	Annual Arithmetic Mean	0.05 ppm (100 ug/m ³)	Same as Primary

¹ Illinois Air Quality Standards are identical to National Air Quality Standards.

NOTE: All standards with averaging time of 24 hours or less are not to be exceeded more than once per year.

AIR POLLUTION EPISODE LEVELS

POLLUTANT	WATCH	YELLOW ALERT	RED ALERT	EMERGENCY
SUSPENDED PARTICULATE MATTER (TSP)	2 hour 5 COH-625 ug/m ³	24 hour 3 COH-375 ug/m ³	24 hour 5 COH-625 ug/m ³	24 hour 7 COH-875 ug/m ³
SULFUR DIOXIDE (SO ₂)	2 hour 0.30 ppm	4 hour 0.30 ppm	4 hour 0.35 ppm	4 hour 0.40 ppm
PRODUCT (SO ₂ x TSP)	2 hour 1.0	4 hour 1.0 24 hour 0.20	4 hour 2.0 24 hour 0.80	4 hour 2.4 24 hour 1.20
CARBON MONOXIDE (CO)	2 hour 30 ppm	8 hour 15 ppm	8 hour 30 ppm	8 hour 40 ppm
PHOTO-CHEMICAL OXIDANTS (O ₃)	(ADVISORY) 2 hour 0.07 ppm	1 hour .17 ppm	1 hour .30 ppm	1 hour .50 ppm
NITROGEN DIOXIDE (NO ₂)	2 hour 0.40 ppm	1 hour 0.60 ppm 24 hour 0.15 ppm	1 hour 1.20 ppm 24 hour 0.30 ppm	1 hour 1.60 ppm 24 hour 0.40 ppm
NON-METHANE HYDROCARBONS (N-MHC)	None	None	None	None

2.0 HEALTH AND WELFARE EFFECTS OF AIR POLLUTANTS

2.1 PARTICULATE MATTER

All air pollutants are not in the gaseous form. Small solid particles and liquid droplets, collectively called particulates or aerosols, are also present in the air in great numbers, and may constitute a pollution problem. Particulates entering the atmosphere differ in size and chemical properties. The effects of particulates on health and welfare are directly related to their size and chemical composition.

Particulate matter in the atmosphere consists of solids, liquids, and/or liquids-solids in combination. Suspended particulates generally refer to particles less than 100 microns in diameter (human hair is typically 100 microns thick) since larger particles will settle out of the air under the influence of gravity in a short time.

Typical sources emitting particles into the atmosphere are combustion of fossil fuels (ash and soot), industrial processes (metals, fibers, etc.), fugitive dust (wind and mechanical erosion of local soil) and photochemically produced particles (complex chain reactions between sunlight and gaseous pollutants). Combustion and photochemical products tend to be smaller in size (less than 1 micron); whereas fugitive dust and industrial products are larger in size (greater than 1 micron).

One of the major problems associated with high concentrations of particulates is that the interaction between the particles and sunlight can potentially result in climatic effects and diminished visibility (smog and haze). Particles play a key role in the formation of clouds, and emissions of large numbers of particles can, in some instances, result in local increases in cloud formation and precipitation. Particles in the size range of 0.1 to 1.0 microns are the most efficient in scattering visible light (wavelength 0.4 to 0.7 microns) thereby reducing visibility. Particles combined with high humidity can result in the formation of haze or smog, which can cause hazardous conditions for the operation of motor vehicles and aircraft.

Particulate pollutants enter the human body by way of the respiratory system; and, therefore, their most immediate effects are upon this system. The size of the particle determines the depth of penetration into the respiratory system. Particles over 5 microns are generally stopped and deposited mainly in the nose and throat. Those that do penetrate deeper in the respiratory system to the air ducts (bronchi) are soon removed by ciliary action. Particles ranging in size from 0.5 - 5.0 microns in diameter can be deposited in the bronchi, with

few reaching the air sacks (alveoli). Most particles deposited in the bronchioles are removed by the cilia within two hours. Particles less than 0.5 micron in diameter reach and may settle in the alveoli. The removal of particles from the alveoli is much less rapid and complete than from the larger passages. Some of the particles retained in the alveoli are absorbed into the blood.

High particulate concentrations have been associated with increased mortality and bronchitis. Long term effects due to the chemical nature of the deposited particulates may be increased incidence of cancer and heart attack. In some instances particles, which by themselves may not have a great effect on health, can absorb toxic gases, reach the alveoli and release the toxic substance into the blood.

Plant surfaces and growth rates may be adversely affected by particulate matter. Particulate air pollution also causes a wide range of damage to materials, and includes corrosion of metals and electrical equipment, and the soiling of textiles and buildings.

Particles which cause the most health and visibility difficulties are those less than 1.0 microns in size. These particles are also the most difficult to reduce in numbers by the various industrial removal techniques. Rainfall-washout accounts for the major removal of these particles.

2.2 SULFUR DIOXIDE

Sulfur dioxide is an atmospheric pollutant which results from combustion processes (mainly burning of fossil fuels containing sulfur compounds), refining of petroleum, manufacture of sulfuric acid, and smelting of ores containing sulfur. Reduction of sulfur dioxide pollution levels can generally be achieved through the use of low sulfur content fuels or the use of chemical sulfur removal systems.

Once in the atmosphere some sulfur dioxide can be oxidized (either photochemically or in the presence of a catalyst) to SO_3 (sulfur trioxide). With water vapor present, SO_3 is readily converted to sulfuric acid mist. Other basic oxides combine with SO_3 to form sulfate aerosols. Sulfuric acid droplets and other sulfates are thought to account for about five to 20 percent of the total suspended particulate matter in urban air.

The effects of the oxides of sulfur on health are related to the irritation of the respiratory system with such injury resulting in temporary or permanent damage.

The enhancement by particulate matter of toxic response to sulfur dioxide (synergism) has been observed under conditions which would promote the conversion of sulfur dioxide to sulfuric acid. The degree of enhancement is related to the concentration of particulate

matter. A threefold to fourfold increase of the irritant response to sulfur dioxide is observed in the presence of particulate matter capable of oxidizing sulfur dioxide to sulfuric acid. There are probably few communities where individuals with impaired health are not susceptible to the adverse effects of elevated levels of sulfur oxides and particulate matter.

Sulfur dioxide can cause acute or chronic leaf injury to plants. Acute injury, produced by high concentrations for relatively short periods, usually results in the injured tissue changing to an ivory color. Chronic injury, which results from lower concentrations over a number of days or weeks, leads to pigmentation of leaf tissue, a gradual yellowing (chlorosis) in which the chlorophyll-making mechanism is impeded. Both acute and chronic injury may be accompanied by the suppression of growth and yield.

Corrosion rates are higher in urban and industrial atmospheres, with relatively high levels of both particulate and sulfur oxides, than they are in rural areas. Sulfur oxides pollution contributes to the damage of electrical equipment of all kinds. Building materials and textile fibers are also harmed by atmospheric sulfur oxides.

2.3 CARBON MONOXIDE

The major source of carbon monoxide (CO), by far, is the motor vehicle. The U.S. EPA has kept under its jurisdiction the regulation of emission control equipment on new motor vehicles, while the State's primary responsibility for reducing excessive ambient carbon monoxide levels is limited to the development of transportation plans for congested urban areas.

The toxic effect of high concentrations of CO (greater than 100 ppm) on the body is well known. Carbon monoxide is absorbed by the lungs and reacts with the hemoglobin of the blood. The absorption of CO is associated with a reduction in the oxygen-carrying capacity of blood. The affinity of hemoglobin for CO is over 200 times that for oxygen, indicating that carboxyhemoglobin (COHb) is a more stable compound than oxyhemoglobin. The higher the percentage of hemoglobin bound up in the form of carboxyhemoglobin, the more serious is the effect.

The level of COHb in the blood is directly related to the CO concentration of the inhaled air. For a given ambient air CO concentration, the COHb level in the blood will reach an equilibrium concentration after a sufficient time period. This equilibrium COHb level will be maintained in the blood as long as the ambient air CO level remains unchanged. However, the COHb level will slowly change in the same direction as the CO concentration of the ambient air as a new equilibrium is established. In this way low level CO poisoning is reversible.

An exposure of eight or more hours to CO concentrations of 10 to 15 ppm has been associated with adverse health effects as manifested by impaired time-interval discrimination, while levels greater than 30 ppm (episode level) can cause problems for individuals with heart disease.

Studies on the existing ambient levels of CO do not indicate any adverse effects on vegetation, materials, or other aspects of human welfare.

2.4 NITROGEN DIOXIDE

Nitrogen gas (N_2) is an abundant and inert gas which makes up almost 80 percent of the earth's atmosphere. In this form, it is harmless to man and essential to plant metabolism. Due to its abundance in the air, it is a frequent reactant in many combustion processes. When combustion temperatures are extremely high, as in the burning of coal, oil, gas, and in automobiles engines, atmospheric nitrogen (N_2) may combine with oxygen (O_2) to form various oxides, NO_x . Of these, nitric oxide (NO) and nitrogen dioxide (NO_2) are the most important contributors to air pollution; NO_x generally is used to represent these. Nitric oxide (NO) is a colorless and odorless gas. It is the primary form of NO_x resulting from the combustion process. NO_x contributes to haze and a reduction of visibility. NO_x is also known to cause deterioration and fading of certain fabrics. Depending on concentration and extent of exposure, plants may suffer leaf crop lesions, and reduced crop yield. NO itself is not considered harmful to humans at concentrations found in the atmosphere, but NO_2 has been shown to cause inflammation in the lungs and bronchi in ranges from .062 to .109 ppm for a 24-hour mean concentration.

The ambient air quality standard for NO_2 is 100 microgram per cubic meter (0.05 parts per million ppm) for an annual average. Until recently, reliable methods for continuously measuring ambient NO_x levels were not available and, therefore, less information is available than for the oxides of sulfur and other pollutants. Even now, different sampling techniques may yield different results; hence the methodology to be used must be chosen carefully in accordance with the purpose of the sampling.

NO_x may also react with water to form corrosive acids, although this is not considered a serious pollution problem; NO_x and various other pollutants (e.g., hydrocarbons) may react in the presence of sunlight to produce photochemical oxidants. These are extremely unstable compounds which damage plants and irritate both the eyes and respiratory system of people. Ozone (O_3) and a group of chemicals called peroxyacetyl nitrates (PAN) are the major constituents of photochemical oxidants.

Methods to control NO_x emissions include the lowering of combustion temperatures and decreasing available oxygen needed for combustion.

2.5 HYDROCARBONS

Studies conducted thus far on the effects of ambient air concentrations of gaseous hydrocarbons have not demonstrated direct adverse effects on human health. But, it has been demonstrated that ambient levels of photochemical oxidant, which do have adverse effects on health, are directly related to gaseous hydrocarbon concentrations; thus, an air quality standard exists for hydrocarbons in order to take into account their contribution to the formation of hazardous photochemical oxidant. The standard is written as a 6-9 a.m. average since hydrocarbons emitted during that period are likely to be involved in the photochemical process.

2.6 PHOTOCHEMICAL OXIDANTS

Photochemical oxidants result from a complex series of atmospheric reactions initiated by sunlight. When reactive hydrocarbons and nitrogen oxides accumulate in the atmosphere and are exposed to the ultraviolet component of sunlight, the formation of new compounds, including ozone and peroxyacetyl nitrates, takes place.

Absorption of ultraviolet light energy by nitrogen dioxide results in its dissociation into nitric oxide and an oxygen atom. The oxygen atoms for the most part react with atmospheric oxygen to form ozone. A small portion of the oxygen atoms and ozone react also with certain hydrocarbons to form free radical intermediates and various products. In some complex manner, the free radical intermediates and ozone react with nitric oxide. A result of these reactions is a very rapid oxidation of the nitric oxide to nitrogen dioxide and an increased concentration of ozone.

Ozone can also be formed naturally in the atmosphere by electrical discharge, and in the stratosphere by solar radiation; both processes are not capable of producing significant urban concentrations of this pollutant.

Injury to vegetation is one of the earliest manifestations of photochemical air pollution, and sensitive plants are useful biological indicators of this type of pollution. The visible symptoms of photochemical oxidant produced injury to plants may be classified as: (1) acute injury, identified by cell collapse with subsequent development of necrotic patterns; (2) chronic injury, identified by necrotic patterns or with other pigmented patterns; and (3) physiological effects, identified by growth alterations, reduced yields, and changes in the quality of plant products. The acute symptoms are generally characteristic of a specific pollutant; though highly characteristic, chronic injury patterns are not. Ozone injury

to leaves is identified as a stippling or flecking. Adverse effects on sensitive vegetation have been observed from exposure to photochemical oxidant concentrations of about 100 ug/m^3 (0.05 ppm) for 4 hours.

Adverse effects on materials (rubber products and fabrics) from exposure to photochemical oxidants have not been precisely quantified, but have been observed at the levels presently occurring in many urban atmospheres.

Adverse health effects, as shown by impairment of performance of student athletes, have occurred over a range of hourly average oxidant concentrations from 60 to 590 ug/m^3 (0.03 to 0.3 ppm). Adverse health effects, as manifested by eye irritation, have been reported when photochemical oxidant concentrations reached instantaneous levels of about 200 ug/m^3 (0.10 ppm), a level that could be related to an hourly average concentration ranging from 60 to 100 ug/m^3 (0.03 to 0.05 ppm).

3.0 AIR SAMPLING NETWORK

3.1 DESCRIPTION OF NETWORK

The Illinois Air Monitoring Network is composed of equipment operated by both the Illinois Environmental Protection Agency and by cooperating local agencies. This network has been designed to measure ambient air quality levels in the various Illinois Air Quality Control Regions (AQCR). These Air Quality Control Regions were developed with consideration given to jurisdictional boundaries, urban-industrial centers, and atmospheric conditions. These factors, when evaluated concurrently, resulted in the designation of an area adequate for the assessment of air quality and the implementation of air quality control measures. Historically, each region was classified on the basis of known air pollutant concentrations or, where these were not known, estimated air quality. A map of the AQCR's in Illinois can be found on the inside front cover.

The present Illinois Environmental Protection Agency Air Monitoring Network is deployed along the lines detailed in the Illinois State Implementation Plan. The Air Monitoring Network encompasses the entire State; however, major concentrations of monitors are found in Region 67 (Metropolitan Chicago) and Region 70 (Metropolitan East St. Louis).

The original emphasis in the design and operation of the Illinois monitoring network was toward meeting the minimum instrument requirements based on the Air Quality Control Region priority classification. An effort was made to locate instruments at sites which would be representative of air quality in the area. For reasons of ease of access and maintenance, several air monitoring instruments were often located at the same site. Because of this, the prime location which might be chosen to monitor sulfur dioxide from fuel combustion sources might be less appropriate for the monitoring of carbon monoxide and vice versa. Recent emphasis has been placed on locating individual monitoring instruments at sites which are likely to represent ambient air quality due to the sources which are primary contributors of the pollutant being measured. The air quality data contained in this report should be viewed with the understanding that the location of the monitoring instrument may preclude obtaining the maximum concentration in all situations.

The Illinois Air Monitoring Network is operated with the cooperation and support of various agencies and local volunteers. Table 3 contains a summary by Air Quality Control Region of the distribution of air monitoring instruments which contribute to the Illinois Ambient Air Monitoring Data Bank. The Illinois Air Monitoring Network contains both continuous and non-continuous instruments. The continuous instruments operate continually throughout the year, while the non-continuous monitoring instruments operate according to the schedule shown in Table 4. This is the official sampling schedule used by the Illinois EPA during 1977.

The present network utilizes instrumentation which is a great deal more sophisticated than was envisioned in the initial State Implementation Plan (1972). More emphasis is presently placed upon the quality assurance, calibration and maintenance aspects of these instruments. It is important to note that most network sensors are measuring pollution concentrations in the parts per billion range; that is, one part of pollutant per billion parts of ambient air, and a significant technical effort must be expended to insure accurate measurement at these levels.

TABLE 3

**DISTRIBUTION OF AIR MONITORING INSTRUMENTS
BY AIR QUALITY CONTROL REGION**

	65	66	67	68	69	70	71	72	73	74	75	Total
Number of Samplers												
Hi-Volume Sampler	8	2	92	1	9	18	4	1	3	4	9	149
AISI Tape Sampler	2		19	1	1	4	1		1	1	3	33
Sulfur Dioxide (Continuous)	5		19		1	5	1		1	1	3	36
Nitrogen Dioxide/ Nitrogen Oxide (Continuous)	2		4			1					1	8
Ozone	1		17		1	4	1		1	1	3	29
Sulfur/Nitrogen Dioxide (Bubbler)	6	3	45	1	1	3	3	1	1	3	3	70
Sulfur Dioxide (Bubbler)			2									2
Carbon Monoxide	1		15		1	2					1	20
Hydrocarbons			4								1	5
Wind Systems	1		13		1	5	1		1	1	3	26
Total	26	5	230	3	15	40	11	2	9	11	27	373

Table 4

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1977 AIR SAMPLING SCHEDULE

1st Quarter

Jan. 1 Sat.
 Jan. 7 Fri.
 Jan. 13 Thur.
 Jan. 19 Wed.
 Jan. 25 Tues.*
 Jan. 31 Mon.
 Feb. 6 Sun.
 Feb. 12 Sat.
 Feb. 18 Fri.
 Feb. 24 Thur.
 Mar. 2 Wed.
 Mar. 8 Tues.*
 Mar. 14 Mon.
 Mar. 20 Sun.
 Mar. 26 Sat.

2nd Quarter

Apr. 1 Fri.
 Apr. 7 Thur.
 Apr. 13 Wed.
 Apr. 19 Tues.*
 Apr. 25 Mon.
 May 1 Sun.
 May 7 Sat.
 May 13 Fri.
 May 19 Thur.
 May 25 Wed.
 May 31 Tues.
 June 6 Mon.*
 June 12 Sun.
 June 18 Sat.
 June 24 Fri.
 June 30 Thur.

3rd Quarter

July 6 Wed.
 July 12 Tues.
 July 18 Mon.*
 July 24 Sun.
 July 30 Sat.
 Aug. 5 Fri.
 Aug. 11 Thur.
 Aug. 17 Wed.
 Aug. 23 Tues.
 Aug. 29 Mon.
 Sept. 4 Sun.*
 Sept. 10 Sat.
 Sept. 16 Fri.
 Sept. 22 Thur.
 Sept. 28 Wed.

4th Quarter

Oct. 4 Tues.
 Oct. 10 Mon.
 Oct. 16 Sun.
 Oct. 22 Sat.*
 Oct. 28 Fri.
 Nov. 3 Thur.
 Nov. 9 Wed.
 Nov. 15 Tues.
 Nov. 21 Mon.
 Nov. 27 Sun.
 Dec. 3 Sat.*
 Dec. 9 Fri.
 Dec. 15 Thur.
 Dec. 21 Wed.
 Dec. 27 Tues.

* Special hi-vol metal analysis sampling date.
 Spectral grade filters will be sent to all operators
 prior to this date with detailed instructions for use.

3.2a DIRECTORY OF AIR QUALITY MONITORING SITES OPERATED DURING 1977

Following is a directory showing the air monitoring sites operated by the Illinois EPA as well as the various cooperating agencies. This directory does not include special purpose monitoring sites or sites operated by private concerns. An explanation of the terms and equipment codes symbols is provided at the end of the directory.

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
65 BURLINGTON-KEOKUK INTERSTATE (ILL. - IND.)					
<u>KNOX COUNTY</u>					
Galesburg (2740 001)	Library Main Street	Ill. EPA/City	N. 4143254 E. 714695	25	TSP
Galesburg (2740 003)	161 South Cherry	Ill. EPA/City	N. 4143174 E. 714633	30	SO ₂ /NO ₂ (Bubbler)
<u>PEORIA COUNTY</u>					
Peoria (6080 001)	610 N. E. Jefferson	Ill. EPA/Peoria Inspections Dept.	N. 4508172 E. 281481	20	TSP
Peoria (RASH) (Disc.) (6080 001)	610 N. E. Jefferson	U.S. EPA/Peoria Inspections Dept.	N. 4508172 E. 281481	20	TSP, SO ₂ /NO ₂ (Bubbler)
Peoria (6080 023)	Firestation #4 2711 S. W. Jefferson	Ill. EPA/Peoria Inspections Dept.	N. 4505814 E. 278611	24	TSP, SO ₂ /NO ₂ (Bubbler)
Peoria (6080 024)	Firestation #8 MacArthur and Hurlburt	Ill. EPA	N. 4507234 E. 279425	24	SO ₂ (Continuous), O ₃ Telemetry
Peoria (6080 027)	Maintenance Building 1604 Detweiller	Ill. EPA/Peoria Inspections Dept.	N. 4518407 E. 279012	20	TSP, SO ₂ /NO ₂ (Bubbler)
Peoria (6080 028)	Old Hall Bradley University	Ill. EPA/Bradley University	N. 4508314 E. 278796	35	TSP
Peoria (6080 029)	Salvation Army 407 N. E. Adams	Ill. EPA	N. 4507925 E. 281401	30	SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, COH, WS/WD, Telemetry
Peoria (6080 030)	City Hall 419 Fulton	Ill. EPA/Peoria Inspections Dept.	N. 4507728 E. 280753	65	SO ₂ /NO ₂ (Bubbler),
Peoria (New) (6080 031)	Administration Building Glen Oak Park Pavilion	Ill. EPA	N. 4509888 E. 282808	15	SO ₂ (Continuous)
<u>TAZEVELL COUNTY</u>					
East Peoria (New) (2100 001)	Lincoln School 801 Springfield Road	Ill. EPA	N. 4503604 E. 282679	15	SO ₂ (Continuous)
East Peoria (2100 002)	East Peoria Bank 235 East Washington	Ill. EPA/Peoria Inspections Dept.	N. 4505074 E. 281061	12	TSP
East Peoria (2100 003)	Illini Brick 1167 West Washington	Ill. EPA/Peoria Inspections Dept.	N. 4506555 E. 281080	15	SO ₂ /NO ₂ (Bubbler)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Pekin (6060 002)	531 Court	Ill. EPA/C11co	N. 4494067 E. 276117	20	TSP
Pekin (6060 004)	Firestation #3 272 Derby	Ill. EPA	N. 4492740 E. 275283	15	SO ₂ (Continuous), COH Telemetry
66 EAST CENTRAL ILLINOIS INTRASTATE					
<u>CHAMPAIGN COUNTY</u>					
Champaign (1140 002)	Regional Office Building 2125 South First Street	Ill. EPA	N. 4437728 E. 394197	20	TSP, SO ₂ /NO ₂ (Bubbler)
<u>MC LEAN COUNTY</u>					
Bloomington (0480 001)	Pantograph Building 301 West Washington	Ill. EPA/Daily Pantograph	N. 4483116 E. 330116	27	TSP, SO ₂ /NO ₂ (Bubbler)
<u>VERMILION COUNTY</u>					
Danville (1720 002)	Vermilion Co. Court House 4 North Vermilion	Ill. EPA/Mr. Bracewell	N. 4441641 E. 446388	65	SO ₂ /NO ₂ (Bubbler)
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)					
<u>COOK COUNTY</u>					
Arlington Heights (0200 001)	33 S. Arlington Heights Rd.	Cook County DEC	N. 4659111 E. 418716	32	TSP
Bedford Park (1540 002)	6535 South Central	Bedford Park Env. Quality Control Board	N. 4624549 E. 436827	30	TSP, SO ₂ (Bubbler) SO ₂ (Continuous), O ₃ , COH
Bedford Park (1540 015)	Community Park 6700 South 78th Avenue	Bedford Park Env. Quality Control Board	N. 4624333 E. 432228	30	TSP, SO ₂ (Bubbler), COH
Blue Island (0500 001)	Eisenhower High School 12700 Sacramento	Cook County DEC	N. 4612262 E. 442932	43	TSP, SO ₂ /NO ₂ (Bubbler)
Blue Island (RASN) (Disc.) (0500 001)	Eisenhower High School 12700 Sacramento	USEPA/Cook County DEC	N. 4612262 E. 442932	43	SO ₂ /NO ₂ (Bubbler)
Calumet City (0780 001)	Thorton Fractional HS 755 Pulaski Road	Cook County DEC	N. 4605938 E. 454802	26	TSP, SO ₂ /NO ₂ (Bubbler) SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Chicago Heights (Disc.) (1240 003)	450 State Street	Ill. EPA/Dawes Labs.	N. 4596617 E. 447327	25	TSP
Chicago Heights (1240 001)	Bloom High School Dixie Highway & 10th Street	Cook County DEC	N. 4595888 E. 446172	33	TSP, SO ₂ /NO ₂ (Bubbler) SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Cicero (1340 001)	Roosevelt High School 15th Street & 50th Avenue	Cook County DEC	N. 4634425 E. 437598	34	TSP, SO ₂ /NO ₂ (Bubbler)
Des Plaines (1840 001)	Maine West High School 1755 South Wolf Road	Cook County DEC	N. 4652290 E. 424858	32	TSP, SO ₂ /NO ₂ (Bubbler)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Evanston (2360 001)	Police Department 1454 Elmwood	Ill. EPA/City	N. 4654734 E. 443240	25	TSP
Flossmoor (2520 001)	Community High School 999 Kedzie Avenue	Cook County DEC	N. 4599302 E. 442080	33	TSP, SO ₂ /NO ₂ (Bubbler)
Franklin Park (2620 001)	E. Leyden High School 3400 North Rose Street	Cook County DEC	N. 4643567 E. 427981	31	TSP
Glenview (2940 001)	Village Hall 1930 Prairie Street	Ill. EPA/City	N. 4658148 E. 433327	25	TSP
Harvey (3180 001)	Lowell School 157th and Lexington	Cook County DEC	N. 4605962 E. 445895	26	TSP, SO ₂ /NO ₂ (Bubbler)
Hillside (3420 001)	Proviso West High School Wolf Road & Harrison Street	Cook County DEC	N. 4635283 E. 425327	33	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
McCook (1540 016)	Village Hall 50th Street and Glencoe	McCook Env. Board	N. 4627820 E. 430808	25	TSP, SO ₂ (Continuous), COH, WS/WD
McCook (1540 017)	Route 66 and Lawndale	McCook Env. Board	N. 4627956 E. 431407	40	TSP
Midlothian (5080 001)	Bremen High School 15202 Crawford Avenue	Cook County DEC	N. 4607135 E. 440339	29	TSP
Morton Grove (5320 001)	Fireside Motel 9111 Waukegan	Cook County DEC	N. 4655197 E. 433944	30	TSP, SO ₂ /NO ₂ (Bubbler)
Niles (5540 001)	Gemini High School 8955 Greenwood Avenue	Cook County DEC	N. 4654611 E. 430623	24	TSP
Oak Park (5740 002)	834 Lake Street	Cook County DEC	N. 4637456 E. 433771	31	TSP, SO ₂ /NO ₂ (Bubbler)
Orland Park (5860 001)	Carl Sandburg High School 133rd and LaGrange Road	Cook County DEC	N. 4610925 E. 428641	23	TSP
Palatine (5900 001)	Township High School 1000 Quentin Road	Cook County DEC	N. 4660703 E. 408549	27	TSP
Park Forest (6000 001)	Water Filtration Plant 100 Park Avenue	Cook County DEC	N. 4593697 E. 443283	30	TSP, SO ₂ /NO ₂ (Bubbler)
River Forest (6540 001)	Junior High School Lathrop and Oak Avenues	Cook County DEC	N. 4637969 E. 432456	31	TSP
Skokie (7160 005)	Niles N. High School 9800 Lawler	Cook County DEC	N. 4656493 E. 437740	41	SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Skokie (7160 006)	Golf Course 4401 Dempster	Ill. EPA/City Health Dept.	N. 4654197 E. 438876	20	TSP
Skokie (7160 007)	Niles East High School 7701 Lincoln Avenue	Ill. EPA/City Health Dept.	N. 4652296 E. 437827	30	TSP
Summit (7520 001)	Graves School 60th and 74th Avenue	Cook County DEC	N. 4625734 E. 433104	23	TSP, SO ₂ /NO ₂ (Bubbler)
Wilmette (8360 001)	Central School 9th Street & Central Ave.	Cook County DEC	N. 4658469 E. 441870	30	TSP, SO ₂ /NO ₂ (Bubbler)
Winnetka (8420 001)	Crow Island School 112 Willow Road	Ill. EPA/Evanston North Shore H.D.	N. 4661092 E. 438104	30	TSP

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Chicago:					
Addams Elementary School (1220 031)	10810 South Avenue "H"	Chicago DEC	N. 4616172 E. 455765	32	TSP, SO ₂ /NO ₂ (Bubbler)
Anthony Elementary School (1220 030)	9800 South Torrence Ave.	Chicago DEC	N. 4618246 E. 453462	16	TSP, SO ₂ /NO ₂ (Bubbler)
Austin West High School (1220 036)	118 North Central	Chicago DEC	N. 4637061 E. 436746	14	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Cont.), Tele., CO, O ₃
Calumet High School (1220 016)	8131 South May Street	Chicago DEC	N. 4621623 E. 445907	48	TSP, SO ₂ /NO ₂ (Bubbler)
CAMP (1220 002)	445 Plymouth Court	USEPA/Chicago DEC	N. 4636074 E. 447765	10	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , THC, CH ₄ , COH.
Carver High School (1220 018)	801 East 133rd Place	Chicago DEC	N. 4611172 E. 449833	49	TSP, SO ₂ /NO ₂ (Bubbler)
Cermak Pump Station (1220 026)	735 West Harrison	Chicago DEC	N. 4635851 E. 446543	26	SO ₂ (Continuous), CN, O ₃ , COH, WS/WD, Telemetry
Chicago City Central Office Building (RASH) (1220 001)	320 North Clark	USEPA/Chicago DEC	N. 4637475 E. 447734	105	TSP, SO ₂ /NO ₂ (Bubbler)
Chicago Vocational H.S. (1220 017)	2100 East 87th Street	Chicago DEC	N. 4620648 E. 452351	55	TSP, SO ₂ /NO ₂ (Bubbler)
Clay Elementary School (1220 019) (DISC)	13231 South Burley Avenue	Chicago DEC	N. 4611358 E. 454617	57	TSP, SO ₂ /NO ₂ (Bubbler)
Cooley Vocational H.S. (1220 012)	1225 North Segwick	Chicago DEC	N. 4639141 E. 447148	51	TSP, SO ₂ /NO ₂ (Bubbler)
Crib (1220 034)	68th St. Lake Michigan	Chicago DEC	N. 4626006 E. 456037	50	TSP, SO ₂ /NO ₂ (Bubbler)
Daley Center (1220 035)	Washington and Clark	Chicago DEC	N. 4636858 E. 447808	7	CO, THC, CH ₄
Edgewater (1220 037)	5358 North Ashland Avenue	Chicago DEC	N. 4647469 E. 444580	23	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CN, O ₃ , COH, Telemetry
Farr Dormitory (DISC) (1220 014)	3300 South Michigan Avenue	Chicago DEC	N. 4631364 E. 448179	40	TSP
Fenger Junior College (1220 010)	11220 South Wallace	Chicago DEC	N. 4615296 E. 447098	48	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, Telemetry
G.S.A. Building (1220 005)	538 South Clark	Chicago DEC	N. 4636074 E. 447763	133	TSP, SO ₂ /NO ₂ (Bubbler)
Hale Elementary School (1220 021)	6140 South Melvina Avenue	Chicago DEC	N. 4625450 E. 435469	31	TSP, SO ₂ /NO ₂ (Bubbler)
Kelly High School (1220 015)	4136 South California Ave.	Chicago DEC	N. 4629666 E. 442129	48	TSP, SO ₂ /NO ₂ (Bubbler)
Kenwood High School (1220 025)	5015 Blackstone	Chicago DEC	N. 4628086 E. 450808	53	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Lakeview High School (1220 004)	4015 North Ashland Ave.	Chicago DEC	N. 4644882 E. 444537	64	TSP, SO ₂ /NO ₂ (Bubbler)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Lindblom High School (1220 007)	6130 South Wolcott Ave.	Chicago DEC	N. 4625623 E. 444086	51	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Logan Sq. (Ill. Bell) (1120 028)	2940 West Cortland Ave.	Chicago DEC	N. 4640438 E. 441962	63	TSP
Medical Center (1220 033)	1947 West Polk	Ill. EPA	N. 4635530 E. 444567	15	TSP, SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/WD, Meteor., Telemetry
South Water Filtr. Plant (1220 032)	3300 East Cheltenham Place	Chicago DEC	N. 4622722 E. 454709	30	TSP, SO ₂ /NO ₂ (Bubbler)
State Office Building (1220 040) (NEW)	160 North LaSalle	Ill. EPA	N. 4636950 E. 447500	11	SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , Telemetry
Steinmetz High School (1220 011)	3030 North Mobile Avenue	Chicago DEC	N. 4642679 E. 435148	73	TSP, SO ₂ /NO ₂ (Bubbler)
Stevenson Ele. School (1220 009)	8010 South Kostner Avenue	Chicago DEC	N. 4621759 E. 439135	71	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Sullivan High School (1220 020)	6631 North Bosworth Avenue	Chicago DEC	N. 4650074 E. 444543	55	TSP, SO ₂ /NO ₂ (Bubbler)
Sunnyside and Knox (1220 027)	4632 West Sunnyside	Chicago DEC	N. 4645962 E. 438228	6	CO
Taft High School (1220 003)	5625 North Natoma Avenue	Chicago DEC	N. 4648111 E. 434438	55	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Von Steuben High School (1220 039)	5039 North Kimball Ave.	Chicago DEC	N. 4646950 E. 440790	81	TSP
Washington High School (1220 022)	3500 East 114th Street	Chicago DEC	N. 4615074 E. 455030	31	TSP, SO ₂ /NO ₂ (Bubbler)
<u>DuPAGE COUNTY</u>					
Addison (0060 001)	City Hall 130 W. Army Trail Road	Ill. EPA/DuPage Co. Health Dept.	N. 4642549 E. 417543	40	TSP
Bensenville (0380 001)	N. Fire Station Main and York Road	Ill. EPA/City	N. 4645234 E. 422222	20	TSP
Bensenville (0380 002)	Beeline Fashions 375 Meyer	Ill. EPA/City	N. 4646345 E. 422055	20	TSP, SO ₂ /NO ₂ (Bubbler)
Elmhurst (2300 001)	Police Station 188 Schiller	Ill. EPA/DuPage Co. Health Dept.	N. 4639049 E. 422123	25	TSP
Naperville (5480 001)	Fire Station 175 Jackson Street	Ill. EPA/DuPage Co. Health Dept.	N. 4624938 E. 404376	25	TSP
West Chicago (8080 001)	DuPage County Airport	Ill. EPA/DuPage Co. Health Dept.	N. 4640808 E. 397063	25	TSP
West Chicago (8080 002)	Police Station 128 West McConnell Street	Ill. EPA/DuPage Co. Health Dept.	N. 4637626 E. 400080	15	TSP
Wheaton (8220 002)	Court House 201 Reber Street	Ill. EPA/DuPage Co. Health Dept.	N. 4635049 E. 408358	50	TSP

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
<u>KANE COUNTY</u>					
Elgin (2260 001)	Modern Dairy 1002 North Liberty	Ill. EPA/City	N. 4656672 E. 395018	25	TSP
<u>KANKAKEE COUNTY</u>					
Bradley (0580 001)	E. Elementary School 610 East Liberty Street	Ill. EPA	N. 4554462 E. 428259	12	TSP
<u>KENDALL COUNTY</u>					
Piano (6280 001)	City Hall Main Street	Ill. EPA/Mrs. Aterburn	N. 4611500 E. 372500	25	TSP
<u>LAKE COUNTY</u>					
Island Lake (4000 001)	Island Lake Grade School	Ill. EPA/Lake Co. Health Dept.	N. 4680666 E. 401416	15	TSP
Lake Bluff (4020 001)	E. Elementary School 121 East Sheridan Place	Ill. EPA/Lake Co. Health Dept.	N. 4680333 E. 430166	30	TSP
North Chicago (RASN) (5620 002)	1850 Lewis Avenue	U.S. EPA/Lake Co. Health Dept.	N. 4686533 E. 429116	30	TSP
Waukegan (8020 001)	City Hall 106 Utica	Ill. EPA/Lake Co. Health Dept.	N. 4690283 E. 430950	15	TSP
Waukegan (8020 002)	N. Fire Station Golf and Jackson	Ill. EPA/L.C.H.D. (H1-Vol), Ill. EPA	N. 4693283 E. 430283	30	TSP, SO ₂ (Continuous)
Waukegan (8020 003)	W. High School 2200 Brookside	Lake County Health Dept.	N. 4690700 E. 428450	50	TSP
Waukegan (8020 004)	County Health Department 3010 Grand Avenue	Ill. EPA/Lake Co. Health Dept.	N. 4691500 E. 427283	15	SO ₂ /NO ₂ (Bubbler)
<u>McHENRY COUNTY</u>					
Cary (1020 001)	Cary High School 1st St. & Three Oaks Road	Ill. EPA/City High School	N. 4674876 E. 397580	20	TSP
Crystal Lake (1680 002)	Franklin & Caroline St.	Ill. EPA/City	N. 4676876 E. 390722	15	TSP
<u>WILL COUNTY</u>					
Crete (1640 001)	Crete Grammar School North & Elizabeth Sts.	Will County Health Dept.	N. 4588265 E. 447635	18	TSP
Joliet (3760 001)	Rialto Building 5 East Van Buren	Will County Health Dept.	N. 4597543 E. 409660	15	TSP
Joliet (3760 002)	Pershing School Midland and Campbell	Will County Health Dept.	N. 4597641 E. 406864	16	TSP, SO ₂ /NO ₂ (Bubbler)
Joliet (3760 003)	Rivals Park 1425 North Broadway	Will County Health Dept.	N. 4607253 E. 409086	20	TSP
Joliet (3760 004)	Gompers School Copperfield and Briggs	Will County Health Dept.	N. 4598833 E. 412790	16	TSP

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Joliet (3760 005)	Joliet and Benton Sts.	Ill. EPA	N. 4598000 E. 409456	20	TSP, SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/WD, Meteor., Telemetry
Joliet (3760 006)	Joliet Junior College 1216 Houbolt Street	Will County Health Dept.	N. 4597456 E. 410320	31	TSP
Joliet (3760 007)	Will County Health Department Building 501 Ella Avenue	Will County Health Dept.	N. 4595172 E. 410814	21	TSP, WS/WD
Lockport (4380 002)	5th & Madison	Will County Health Dept.	N. 4604796 E. 412641	15	TSP, SO ₂ /NO ₂ (Bubbler)
Mokena (8320 006)	10940 Front Street	Will County Health Dept.	N. 4598129 E. 426141	14	TSP
Monee (8320 005)	432 East Main Street	Will County Health Dept.	N. 4585320 E. 438438	16	TSP
Plainfield (6270 001)	Indian Trail Junior High 1005 Eastern	Will County Health Dept.	N. 4607438 E. 400395	16	TSP
Rockdale (8320 004)	Well #2 Pumping Station	Will County Health Dept.	N. 4595370 E. 466870	16	TSP, SO ₂ /NO ₂ (Bubbler) COH
Romeoville (6760 001)	Naperville Road	Will County Health Dept.	N. 4612240 E. 409680	28	TSP, SO ₂ /NO ₂ (Bubbler), COH
Wilmington (DISC) (8380 002)	201 North Main	Will County Health Dept.	N. 4611500 E. 372500	14	TSP
Wilmington (8380 003)	South Joliet Street Wilmington High School	Will County Health Dept.	N. 4572808 E. 403481	15	TSP
68 METROPOLITAN DUBUQUE INTERSTATE (ILL. - WIS. - IOWA)					
JO DAVIESS COUNTY					
Galena (2720 002)	Kraft Foods Commerce Plant 311 South Main Street	Ill. EPA/ Jo Daviess Co. Health Dept.	N. 4698882 E. 711611	25	TSP, SO ₂ /NO ₂ (Bubbler)
Galena (2720 001)	Jo Daviess County Health Department Building	Ill. EPA/ Jo Daviess Co. Health Dept.	N. 4698895 E. 711302	25	COH
69 METROPOLITAN QUAD CITIES INTERSTATE (ILL. - MO.)					
ROCK ISLAND COUNTY					
East Moline (2080 001)	City Hall 915 16th Avenue	Ill. EPA/Quad Cities Area Regional APC AG	N. 4598938 E. 713543	15	TSP, SO ₂ /NO ₂ (Bubbler)
Milan (5100 001)	Elementary School 125 West 2nd Avenue	Ill. EPA/Quad Cities Area	N. 4591604 E. 703240	25	TSP
Moline (RASN) (5120 001)	City Hall 619 16th Street	U.S. EPA/City Health Dept.	N. 4597549 E. 707530	30	TSP
Moline (5120 001)	City Hall 619 16th Street	Ill. EPA/City Health Dept.	N. 4597549 E. 707530	30	TSP
Moline (5120 002)	Moline High School 3600 23rd Avenue	Quad Cities Area Regional APC AG	N. 4595691 E. 709925	35	TSP

SITE DIRECTORY

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Rock Island (RASN) (6700 001)	1528 3rd Avenue	U.S. EPA/Quad City Air Pollution	N. 4597950 E. 702179	45	TSP
Rock Island (DISC) (6700 002)	County Hall 1504 3rd Avenue	Ill. EPA	N. 4597919 E. 701975	35	SO ₂ (Continuous), CO, O ₃ , CNH, WS/WD, Telemetry
Rock Island (6700 003)	High School 1400 25th Avenue	Quad Cities Area Regional APC AG	N. 4595493 E. 702327	30	TSP
<u>WHITESIDE COUNTY</u>					
Rock Falls (6660 001)	Rock Falls High School 101 12th Avenue	Whiteside County H.D./Ill. EPA	N. 4628333 E. 274700	25	TSP
Sterling (7400 001)	Fire Station 110 West 5th Street	Ill. EPA/Sterling H.S.	N. 4629583 E. 275283	28	TSP
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)					
<u>MADISON COUNTY</u>					
Alton (0160 004)	City Hall 103 East 3rd Street	Ill. EPA	N. 4308216 E. 744166	32	TSP
Alton (DISC) (0160 005)	Lowell School 1616 Joesting	Ill. EPA	N. 4308265 E. 746388	50	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , CNH, WS/WD
Alton (NEW) (0160 006)	Horace Mann School 2708 Edwards St.	Ill. EPA	N. 4309512 E. 747407	40	TSP, SO ₂ (Continuous), O ₃ , WS/WD, Telemetry
Collinsville (1500 002)	EPA Office 115A West Main	Ill. EPA	N. 4284232 E. 239953	40	TSP
Edwardsville (2180 002)	Madison County Court House Main & Purcell	Ill. EPA	N. 4299944 E. 242938	50	TSP
Granite City (2960 006)	City Hall 2000 Edison Avenue	Ill. EPA/Granite City APC	N. 4287407 E. 747771	40	TSP, SO ₂ /NO ₂ (Bubbler)
Granite City (2960 007)	Fire Station #1 23rd and Madison	Granite City APC	N. 4287734 E. 748481	45	TSP
Granite City (2960 008)	Lake School 3201 East 23rd	Granite City APC	N. 4287580 E. 750611	14	TSP
Granite City (2960 009)	2001 East 20th	Granite City APC	N. 7286654 E. 748777	15	TSP
Granite City (2960 010)	15th and Madison	Granite City APC	N. 4286500 E. 747277	15	TSP
Granite City (2960 011)	Fire Station #2 Roosevelt and Rock Road	Granite City APC	N. 4288333 E. 746586	18	TSP
Granite City (2960 012)	Granite City APC Office 2301 Adams	Granite City APC	N. 4288240 E. 747895	35	SO ₂ (Continuous), CO ^d , CNH, WS/WD
Granite City (2960 015)	Frohart School 2040 Johnson	Ill. EPA/Granite City	N. 4289753 E. 750611	20	TSP
Granite City (NEW) (2960 017)	2001 Edison	Granite City APC	N. 4287364 E. 747864	10	CO
Wood River (8520 007)	Water Treatment Plant 54 N. Walcott	Ill. EPA	N. 4305185 E. 751135	15	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , CNH, WS/WD, Telemetry

SITE DIRECTORY

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
<u>MONROE COUNTY</u>					
Columbia (1520 001)	City Hall 208 South Rapp	Ill. EPA	N. 4258345 E. 744376	30	TSP
<u>ST. CLAIR COUNTY</u>					
Belleville (0320 001)	City Hall 101 South Illinois	Ill. EPA	N. 4266734 E. 329790	30	TSP
Cahokia State Park (2120 009)	Business Route 40	Ill. EPA	N. 4282858 E. 754623	15	TSP, SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Meteor., Telemetry
East St. Louis (2120 002)	City Hall 7 Collinsville Avenue	Ill. EPA/City	N. 4279043 E. 747277	50	TSP
East St. Louis (2120 008)	Federal Building 650 Missouri	Ill. EPA	N. 4278783 E. 747543	60	SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
71 NORTH CENTRAL ILLINOIS INTRASTATE					
<u>BUREAU COUNTY</u>					
DePue (0680 001)	Non-Responsive	Non-Responsive	Non-Responsive	6.5	TSP
<u>LaSALLE COUNTY</u>					
LaSalle (4080 001)	LaSalle-Peru High School 541 Chartres	Ill. EPA	N. 4577611 E. 323469	40	SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Oglesby (5800 001)	Non-Responsive	Non-Responsive	Non-Responsive	6.5	TSP
Ottawa (5880 002)	Ottawa Township High Sch. 211 East Main	Ill. EPA/Mr. Krabel	N. 4578475 E. 346296	50	TSP, SO ₂ /NO ₂ (Bubbler)
<u>MARSHALL COUNTY</u>					
Henry (3275 001)	Henry High School Route 29	Ill. EPA/Mr. Guyer	N. 4554092 E. 301098	20	SO ₂ /NO ₂ (Bubbler)
<u>PUTNAM COUNTY</u>					
Hennepin (6420 005)	Non-Responsive	Non-Responsive	Non-Responsive	6.5	TSP
72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)					
<u>MASSAC COUNTY</u>					
Metropolis (5060 007)	Massac County Hospital	Ill. EPA/ Hospital	N. 4114493 E. 345493	40	TSP, SO ₂ /NO ₂ (Bubbler)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILL. - WIS.)					
<u>DeKALB COUNTY</u>					
DeKalb (1780 001)	Municipal Building 200 South 4th	Ill. EPA/DeKalb A&W Pol. Cont. Com.	N. 4642796 E. 354722	30	TSP
<u>WINNEBAGO COUNTY</u>					
Rockford (6680 005)	Pump House 1528 18th Avenue	Ill. EPA/ Winnebago Co. Health Dept.	N. 4679253 E. 328969	20	SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Rockford (6680 008)	Jefferson High 2525 Ohio	Ill. EPA/ Winnebago Co. Health Dept.	N. 4678234 E. 331043	15	TSP
Rockford (6680 001)	Old City Hall 126 South 1st Street	Ill. EPA/ Winnebago Co. Health Dept.	N. 4681401 E. 327790	50	TSP
74 SOUTHEAST ILLINOIS INTRASTATE					
<u>EFFINGHAM COUNTY</u>					
Effingham (2200 001)	USDA Building 1015 South Willow	Ill. EPA/Mr. Rexroat	N. 4330583 E. 366866	20	TSP, SO ₂ /NO ₂ (Bubbler)
<u>JACKSON COUNTY</u>					
Carbondale (NEW) (0840 002)	306 West Main Street	Ill. EPA/SIU	N. 4177660 E. 304518	30	TSP, SO ₂ /NO ₂ (Bubbler)
<u>JEFFERSON COUNTY</u>					
Mt. Vernon (5420 002)	State Office Building 601 North 18th Street	Ill. EPA	N. 4243166 E. 332672	40	TSP
<u>WILLIAMSON COUNTY</u>					
Marion (4720 001)	State Office Building 2209 West Main Street	Ill. EPA	N. 4177240 E. 327833	25	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
75 WEST CENTRAL ILLINOIS INTRASTATE					
<u>ADAMS COUNTY</u>					
Quincy (6440 002)	Central Fire Station 9th and Vermont	Ill. EPA/City (H1-Vol), Ill. EPA	N. 4421487 E. 636512	30	TSP, SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Quincy (6440 003)	Sewage Plant	Ill. EPA/City	N. 4418679 E. 635629	20	TSP
Quincy (6440 004)	Quincy College 18th and Elm	Ill. EPA/Quincy College	N. 4422123 E. 637808	45	SO ₂ /NO ₂ (Bubbler)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
<u>MACON COUNTY</u>					
Decatur (1740 002)	Grant School 22nd and Geddes	III. EPA	N. 4413703 E. 335413	20	TSP
Decatur (DISC) (1740 003)	125 North Franklin	III. EPA	N. 4411900 E. 332900	37	TSP
Decatur (1740 004)	Harris School 600 East Garfield	III. EPA	N. 4414179 E. 333345	14	TSP
Decatur (1740 006)	Fire Station #4 2760 North 22nd Street	III. EPA	N. 4415382 E. 335364	25	SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Decatur (1740 007)	Fire Station #1 Franklin and Wood	III. EPA	N. 4411679 E. 333037	25	SO ₂ /NO ₂ (Bubbler)
Decatur (NEW) (1740 008)	Jasper and Orchard	III. EPA	N. 4412975 E. 334055	30	TSP
Decatur (NEW) (1740 009)	750 E. Lake Shore Drive	III. EPA	N. 4410043 E. 333574	25	TSP
<u>MENARD COUNTY</u>					
Petersburg (6170 001)	7th & Jackson	III. EPA	N. 4432518 E. 256722	15	TSP
<u>SANGAMON COUNTY</u>					
Springfield (7280 001)	Municipal Building 8th and Monroe	U.S. EPA/City Dept. of Public Health & Safety	N. 4408604 E. 273419	20	TSP
Springfield (7280 003)	224 West Adams	III. EPA	N. 4408808 E. 272462	15	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/WD, Meteor., Telemetry

EQUIPMENT CODE SYMBOLS

TSP - Total Suspended Particulate
 SO₂ - Sulfur Dioxide
 NO - Nitric Oxide
 NO₂ - Nitrogen Dioxide
 CO - Carbon Monoxide
 O₃ - Ozone
 RHC - Reactive Hydrocarbons

THC - Total Hydrocarbons
 CH₄ - Methane
 COH - Coefficient of Haze
 WS/WD - Wind Speed and Direction
 Meteor. - Meteorological Parameters
 (eg. Rain Fall, Atmospheric Pressure,
 Solar Radiation, Temperature)

n - instrument installed during 1977
 d - instrument removed during 1977
 NEW - site started in 1977
 DISC - site discontinued in 1977

UTM COORD.

N. - Northing Coordinates
 E. - Easting Coordinates

3.2b DIRECTORY OF SPECIAL PURPOSE AND INDUSTRIAL MONITORING SITES OPERATED DURING 1977

Following is a directory showing the special purpose sites operated by the Illinois Environmental Protection Agency as well as privately operated monitoring sites.

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
65 BURLINGTON-KEOKUK INTERSTATE (ILL. - IND.)					
<u>PEORIA COUNTY</u>					
Starr (6080 900)	Peoria County	Commonwealth Edison-Cilco	N. 4505750 E. 277225	13	SO ₂ (Continuous), TSP
Allied Mills (6100 900)	Peoria County	Commonwealth Edison-Cilco	N. 4502550 E. 273820	13	SO ₂ (Continuous), TSP
Keystone (6100 901)	Peoria County	Commonwealth Edison-Cilco	N. 4501360 E. 277480	13	SO ₂ (Continuous), TSP
State Hospital (6100 902)	Peoria County	Commonwealth Edison-Cilco	N. 4501740 E. 274720	13	SO ₂ (Continuous), TSP
Limestone (6100 903)	Peoria County	Commonwealth Edison-Cilco	N. 4500990 E. 275550	13	SO ₂ (Continuous), TSP
Ozark (6100 904)	Peoria County	Commonwealth Edison-Cilco	N. 4501530 E. 273350	13	SO ₂ (Continuous), TSP
Hurst (6100 905)	Peoria County	Commonwealth Edison-Cilco	N. 4497030 E. 273530	13	SO ₂ (Continuous), TSP
Boswell (6100 906)	Peoria County	Commonwealth Edison-Cilco	N. 4495270 E. 268480	13	SO ₂ (Continuous), TSP
Gebhart (6100 907)	Peoria County	Commonwealth Edison-Cilco	N. 4495460 E. 270250	13	SO ₂ (Continuous), TSP
<u>TAZEVELL COUNTY</u>					
Lawndale (6060 900)	Pekin	Commonwealth Edison-Cilco	N. 4495460 E. 277240	13	SO ₂ (Continuous), TSP
Park (6060 901)	Pekin	Commonwealth Edison-Cilco	N. 4494070 E. 277360	13	SO ₂ (Continuous), TSP
Lutz (7600 900)	Tazewell County	Commonwealth Edison-Cilco	N. 4486660 E. 270650	13	SO ₂ (Continuous), TSP
Garman (7600 901)	Tazewell County	Commonwealth Edison-Cilco	N. 4485920 E. 271050	13	SO ₂ (Continuous), TSP
66 EAST CENTRAL ILLINOIS INTRASTATE					
<u>CHAMPAIGN COUNTY</u>					
Champaign (1140 003)	WCIA-TV Studio 509 South Neil Street	Ill. EPA	N. 4440586 E. 393993	15	O ₃
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)					
<u>COOK COUNTY</u>					
Arlington Heights (0200 002)	33 S. Arlington Hts. Road	Ill. EPA	N. 4659111 E. 418716	30	O ₃
Des Plaines (Disc.) (1840 001)	Main West High School 1755 South Wolf Road	Ill. EPA	N. 4652290 E. 424858	32	O ₃
Evanston (2360 002)	Water Pumping Station 531 East Lincoln	Ill. EPA	N. 4656685 E. 444098	30	O ₃

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Chicago:					
University of Chicago (Disc.) (1220 034)	1525 East Hyde Park Blvd.	Ill. EPA	N. 4627950 E. 45895	40	O ₃
<u>DuPAGE COUNTY</u>					
Wheaton (8220 003)	111 North County Farm Road	Ill. EPA	N. 4634987 E. 406993	49	O ₃
<u>KANKAKEE COUNTY</u>					
Kankakee (3820 001)	City Hall, Room 218 209 North Indiana Avenue	Ill. EPA	N. 4552172 E. 427777	35	O ₃
<u>LAKE COUNTY</u>					
Libertyville (4260 001)	Butterfield School 1441 Lake	Ill. EPA	N. 4682166 E. 418416	25	O ₃
Waukegan (8020 002)	North Fire Station Golf and Jackson	Ill. EPA	N. 4693283 E. 430283	30	O ₃
Lewis Site (8020 006)	Waukegan	Commonwealth Edison	N. 4692400 E. 429100	15	TSP, SO ₂ (Continuous)
Headquarters Site (8020 007)	Waukegan	Commonwealth Edison	N. 4694900 E. 426000	15	TSP, SO ₂ (Continuous)
<u>MC HENRY COUNTY</u>					
McHenry (Disc.) (4520 001)	Police Station 1111 North Green Street	Ill. EPA		30	O ₃
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)					
<u>MADISON COUNTY</u>					
Granite City (Disc.) (2960 013)	Lincoln and Nameoki	Ill. EPA/Granite City APC	N. 4287400 E. 750500	15	TSP
Granite City (2960 014)	Norfolk and Western	Ill. EPA/Granite City APC	N. 4286388 E. 749888	15	TSP
Granite City (New)	23rd and Nameoki	Ill. EPA/Granite City APC	N. 4287395 E. 750327	15	TSP
Granite City (New) (2960 017)	19th and Adams	Industrial	N. 7287425 E. 747629	15	TSP
71 NORTH CENTRAL ILLINOIS INTRASTATE					
<u>BUREAU COUNTY</u>					
DePue (0680 005)	S.W. Corner of Plant	Mobil Chemical	N. 4577240 E. 306660	15	SO ₂ (Continuous)
DePue (0680 006)	White City Park	Mobil Chemical	N. 4577518 E. 308203	15	SO ₂ (Continuous)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
<u>LaSALLE COUNTY</u>					
Oglesby (New) (5800 002)	Non-Responsive	Ill. EPA	Non-Responsive	6.5	TSP
Oglesby (New) (5800 003)	Fire Station 110 W. 2nd Street	Ill. EPA	N. 4573123 E. 327345	18	TSP
Oglesby (New) (5800 004)	Kasap Lot Maple and Watson	Ill. EPA	N. 4573123 E. 328067	6.5	TSP
Oglesby (5800 005)	1098 East Walnut	Ill. EPA	N. 4573150 E. 32700	30	WS, WD
72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)					
<u>MASSAC COUNTY</u>					
Station 10 (4900 001)	Massac County	TVA	N. 4116530 E. 344760	12	TSP, SO ₂ (Continuous)
Station 11 (5060 006)	Metropolis	TVA	N. 4113250 E. 345400	12	TSP, SO ₂ (Continuous)
Station 16 (4900 002)	Massac County	TVA	N. 4118250 E. 338720	12	SO ₂ (Continuous)
Station 17 (4900 003)	Massac County	TVA	N. 4119940 E. 348840	12	SO ₂ (Continuous)
Station 18 (4900 004)	Massac County	TVA	N. 4116370 E. 348700	12	SO ₂ (Continuous)
Station 19 (4900 005)	Massac County	TVA	N. 4120180 E. 342600	12	SO ₂ (Continuous)
73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILL.-WIS.)					
<u>DeKALB COUNTY</u>					
DeKalb (1720 002)	Faraday Hall Chemistry Department	Ill. EPA	N. 4643672 E. 353327	25	O ₃
75 WEST CENTRAL ILLINOIS INTRASTATE					
<u>MONTGOMERY COUNTY</u>					
Zenobia (5220 001)	Montgomery County	Commonwealth Edison	N. 4377900 E. 280600	18	SO ₂ (Continuous)
<u>MACON COUNTY</u>					
Decatur (New) (1740 010)	24th and Locust	Ill. EPA	N. 4413302 E. 335827	15	TSP
Decatur (New) (1740 011)	Condit Street Torrence Park	Ill. EPA	N. 4413055 E. 334839	15	TSP, WS, WD
<u>CHRISTIAN COUNTY</u>					
Edinburg (1320 001)	Christian County	Commonwealth Edison	N. 4391960 E. 292560	18	SO ₂ (Continuous)
Sangchris (1320 002)	Christian County	Commonwealth Edison	N. 4388200 E. 285650	18	SO ₂ (Continuous)

SITE DIRECTORY

STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Clark (1320 003)	Christian County	Commonwealth Edison	N. 4383000 E. 285700	18	SO ₂ (Continuous)
Kincaid (1320 004)	Christian County	Commonwealth Edison	N. 4382860 E. 289850	18	SO ₂ (Continuous)
Jeisyville (1320 005)	Christian County	Commonwealth Edison	N. 4382480 E. 294830	18	SO ₂ (Continuous)
Clear Creek (1320 006)	Christian County	Commonwealth Edison	N. 4375920 E. 288160	18	SO ₂ (Continuous)
<u>SANGAMON COUNTY</u>					
Springfield (7280 004)	WTAX-WDBR Radio Station 712 South Dirksen Parkway	Ill. EPA	N. 4407700 E. 277700	15	SO ₂ (Continuous)
Pawnee (6980 003)	Sangamon County	Commonwealth Edison	N. 4385230 E. 278000	18	SO ₂ (Continuous)
New City (6980 001)	Sangamon County	Commonwealth Edison	N. 4396610 E. 281960	18	SO ₂ (Continuous)
Cascade (6980 002)	Sangamon County	Commonwealth Edison	N. 4395590 E. 286070	18	SO ₂ (Continuous)

3.3 AMBIENT AIR SAMPLING METHODOLOGIES

The Illinois Ambient Air Monitoring Network is essentially two networks--one noncontinuous or intermittent, the other continuous. Noncontinuous samplers are generally used to measure average air quality over time periods of twenty-four hours and have restricted utility for measuring short-term variations in air quality. Continuous samplers on the other hand perform constant surveillance and easily accommodate averaging periods of one hour. Continuous instruments are, therefore, necessary in areas of potential rapidly changing air quality and for measurements involving short-term (24 hours or less) ambient air standards. Continuous instruments are also necessary in situations requiring real time data for the control of air pollution episodes.

The noncontinuous network is comprised of total suspended particulate (TSP) and gas impinger samplers. These instruments are operated on a USEPA coordinated sampling schedule involving a 24-hour period every six days. Within Illinois, the city of Chicago and Cook County agencies operate on a schedule of twice the USEPA frequency obtaining noncontinuous samples every three days.

Continuous measurements are made for sulfur dioxide, nitrogen oxides, carbon monoxide, ozone and reactive hydrocarbons with the majority of these sensors responding real time via a telemetry network. New continuous instrumentation used in the measurement of ambient concentration of criteria air pollutants is required to be designated a reference or equivalent method by the U. S. Environmental Protection Agency as of February 18, 1976. Continuous equipment existing prior to that date can continue to be used until February 18, 1980 under the provisions of this regulation. (Fed. Reg. - Tues., Feb. 18, 1975, p. 7044) Table 5 of this section contains a listing of approved continuous instruments for sulfur dioxide, ozone, carbon monoxide, and nitrogen dioxide. At present no reference method for monitoring reactive hydrocarbons is available.

NONCONTINUOUS INSTRUMENTATION

TOTAL SUSPENDED PARTICULATE (TSP) SAMPLERS

Eight by ten inch glass fiber filters are conditioned to reach a stabilized moisture content after which their weight is accurately determined. The filters are then placed on a hi-volume sampler with air drawn through them at the rate of 40 to 60 cubic feet per minute for 24 hours. These instruments ordinarily operate on a midnight to midnight schedule. The exposed glass filters are then returned to the conditioning environment and allowed to re-equilibrate with respect to moisture content. When this equilibrium has been reached, the filters are reweighed. The differential weight is divided by the total air flow to yield a concentration in particulate weight per volume of air sampled (micrograms of TSP per cubic meter of air). In general, particles between 0.1 and 100 microns in diameter can be collected. (Fed. Reg. - Thurs., Nov. 25, 1971, pp. 22388-90)

IMPINGER (BUBBLER) SAMPLERS

These intermittent samplers are used to measure sulfur dioxide and nitrogen dioxide levels in ambient air. Ambient air is drawn through a solution where the pollutant in question is selectively absorbed with high efficiency. Air flows through the absorbing solutions at a rate of 0.2 liters per minute for a sampling period of 24 hours. After a sample is collected, the solutions are returned to the laboratory for analysis. Due to thermal instability and time decomposition of the collected samples the impinger (bubbler) samplers have been discontinued by the Illinois Environmental Protection Agency as of January 1, 1978. They will be replaced, where required by the implementation plan, with continuous instrumentation.

Sulfur Dioxide Analysis

The absorbing solution for sulfur dioxide is a tetrachloromercurate solution. The absorbed sample is analyzed for sulfur dioxide concentration using the paraosaniline reference procedure outlined in the Federal Register. (Fed. Reg. - Wed., Aug. 13, 1975, pp. 34024-5) The concentration in solution, divided by the air flow, times the gas factor for sulfur dioxide gives the concentration of sulfur dioxide in parts per million for that sampling period.

Nitrogen Dioxide Analysis

The absorbing solution for nitrogen dioxide sampling is a sodium hydroxide-sodium arsenite solution and the absorbed sample is analyzed using the manual equivalent procedure specified in December, 1977. (Fed. Reg. - Wed., Dec. 14, 1977, pp. 62972) The solution is analyzed for concentration of nitrogen dioxide by a colorimetric method and the concentration in solution, divided by the air flow, times the gas factor gives the ambient concentration of nitrogen dioxide in parts per million.

METALS CONTENT OF PARTICULATE SAMPLES

Portions of exposed hi-vol filters are subjected to chemical digestion followed by an analysis by atomic absorption for various metals. These analyses are done on individual filters and in some cases on composites (all filters for a calendar month are combined and analyzed to provide a monthly average). Ambient concentrations of copper, cadmium, lead, zinc, arsenic, manganese, nickel and chromium are routinely determined and reported as micrograms of the metal per cubic meter of air.

CONTINUOUS INSTRUMENTATION

TSP TAPE SAMPLERS (Hemeon and Ide, 1953)

Ambient air is drawn through a paper tape filter at a flow rate of 0.22 cubic feet per minute (CFM) for a variable period (generally two hours). The percent of light transmittance through the tape is continuously monitored. The decrease in percent transmission with time is related to the collection of particulate matter on the filter tape and is termed coefficient of haze (COH). A comparison between results obtained from hi-volume samplers and tape sampler found widely varying correlations. This is apparently because of the optical properties associated with particles collected by the tape sampler. Rough correlations, however, between the two methods use 125 micrograms per cubic meter TSP as equivalent to 1 COH. Following the sampling period, the paper tape advances to a clean spot and the sampling cycle begins again. Due to variances caused by color and size of material collected and the inability to correlate data with hi-volume sampler data, the TSP tape samplers have been discontinued by the Illinois Environmental Protection Agency as of January 1, 1978. Various real time continuous particulate samplers are under investigation to find a replacement sampler which will provide data comparable to the hi-volume. These new instruments should be operational by August 1978.

SULFUR DIOXIDE

A. Colorimetric Monitors

Ambient air is drawn through an absorbing column where it is continuously mixed with a solution of tetrachloromercurate absorbing the sulfur dioxide. A portion of this solution is mixed with formaldehyde, sulfamic acid, and pararosaniline dye and allowed to flow through a time delay coil where mixing and chemical reaction between the sulfur dioxide and the analytical reagents take place. The resulting dye complex is spectrophotometrically analyzed using a flow cell colorimeter at a specific wavelength. The change in percent transmission of the solution is related to concentration of sulfur dioxide in the ambient air. This ambient analysis procedure is identical to the reference procedure EQS-0775-001 (analysis of manually collected samples, i.e. impingers) with the exception that an absorbing coil is used to obtain a continuous sample.

B. Coulometric Monitor

Ambient air is drawn through an acid solution of bromine and bromide ions. The reaction between sulfur dioxide and bromine results in a shift of electrical equilibrium in the solution. The electrical current required to reform sufficient bromine from the bromide ions to re-establish the original equilibrium is proportional to the sulfur dioxide concentration in the ambient air sampled.

C. Pulsed Fluorescent Monitor

Ambient air is drawn into a chamber where it is pulse irradiated with ultra-violet light of a specific wavelength. The sulfur dioxide molecules present absorb photons of energy from this light. When these excited molecules revert back to their original energy state, they release energy in the form of light and the intensity of the emitted light is measured and converted into a sulfur dioxide concentration.

D. Flame Photometric Detector Monitor

Ambient air is drawn into a chamber where it is burned in a hydrogen hyperventilated air diffusion flame. The luminescence resulting from the reaction of the ambient sulfur molecules with the flame is absorbed by a photomultiplier detector. The resulting output from this detector is related to the sulfur dioxide concentration in the ambient air.

E. Second Derivative Spectrophotometric Monitor

Ambient air is drawn through a sample chamber into which ultra-violet light at a particular wavelength is directed. The second derivative spectrum of this beam is monitored continuously at a particular wavelength. The intensity of this spectrum is related to concentration of sulfur dioxide in the ambient air.

NITROGEN DIOXIDE (Chemiluminescent Monitor)

A. Single Channel, Single Detector

Ambient air is drawn into the unit by two paths. In one path, the sample is exposed to ozone directly and the light produced by the reaction between nitric oxide (NO) and ozone is measured and calculated as nitric oxide concentration in ambient air. In the other path, the sample passes through a converter changing quantitatively the oxides of nitrogen (NO_x) in the sample into nitric oxide (NO). This sample is then exposed to ozone and the light produced by the chemiluminescence measured and calculated as total oxides of nitrogen concentration in ambient air. These measurements are made alternately and then either subtracted electronically or manually to give the concentration of nitrogen dioxide in the ambient air.

B. Dual Chamber, Single Detector

The chemiluminescence reaction and detection method is the same as in "A" above, except that samples of ambient air are made simultaneous for both the nitric oxide and total oxides of nitrogen measurements rather than alternating back and forth. The detector observes the reaction chambers alternately and the results are calculated as before to give the concentration of nitrogen dioxide in the ambient air.

C. Dual Chamber, Dual Detector

The chemiluminescence reaction is the same as in "A" and "B" above, except that each of the chambers operates with its own independent detector; one measuring nitric oxide and the other measuring total oxides of nitrogen. Again, the results are calculated as before to give the concentration of nitrogen dioxide in the ambient air.

OZONE

A. Ultra-Violet Absorption Monitor

Ambient air is drawn through a sample chamber into which a beam of ultra-violet light of a particular wavelength is passed. This beam is monitored continuously for any decrease in intensity which is due to the absorption of incident light by ozone molecules present in the air. The decrease in light transmittance is translated into ozone concentration in the ambient air.

B. Chemiluminescent Monitor

Ambient air is drawn into a reaction chamber where the sample is mixed with ethylene gas. Ozone reacts quantitatively with the ethylene to produce light which is detected by a photodetector and its intensity related to the concentration of ozone in the ambient air.

CARBON MONOXIDE

A. Non-Dispersive Infrared (NDIR) Monitor

Ambient air is drawn through a sample chamber into which a beam of infrared light at a particular wavelength is passed. This beam is continuously monitored and any decrease in intensity at the specific wavelength is due to the absorption of light by the carbon monoxide molecules present. This decrease is directly related to the concentration of carbon monoxide in the ambient air.

B. Gas Chromatograph-Flame Ionization Monitor

Ambient air is drawn through a gas chromatographic column where the carbon monoxide component is separated from the other components. The carbon monoxide is then reduced to methane and burned in a hydrogen flame. The change in the electro-potential of the collector due to the increase ionization produced by this burning is translated into a concentration of carbon monoxide in ambient air.

REACTIVE HYDROCARBON (TOTAL HYDROCARBON LESS METHANE) MONITORS

A. Gas Chromatography-Flame Ionization Detection

Ambient air is drawn through a chromatographic column where the hydrocarbon component is then divided; one portion is totally converted to methane and introduced into a flame, the other portion is pretreated so that only the ambient methane component of the hydrocarbon sample is separated and introduced into the flame. In the flame, the burning of the methane results in a change in the electro-potential of the collectors due to the increased ionization which is correlated to the concentration of methane and total hydrocarbon as methane depend upon the portion analyzed. Using either an electronic subtraction circuit or manual subtraction, the value for the concentration of reactive hydrocarbons in ambient air is determined.

TABLE 5
LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS
(12-31-77)

Designation Number	Identification	Source	Federal Register Notice	
			Vol.	Page
Sulfur Dioxide EQS-0775-001	Pararosaniline Method-- Technicon I (Auto-Analysis of Manually Collected Samples)	Technicon	40	34024
EQS-0775-002	Pararosaniline Method-- Technicon II (Auto-Analysis of Manually Collected Samples)	Technicon	40	34024
EQSA-1275-005	SM 1000 Second Derivative Spectrophotometer)	Lear Siegler	41	3893
EQSA-1275-006	SA 185-2A (Flame Photometric)	Meloy	41	3893
EQSA-0276-009	43 (Pulsed Fluorescence)	Thermo Electron	41	8531
EQSA-0676-010	PW 9755 (Coulometric)	Philips	41	26252
EQSA-0876-011	PW 9700 (Coulometric)	Philips	41	34105
EQSA-0876-013	8450 (Flame Photometric)	Monitor Labs	41	36245
EQSA-0877-024	500 (Coulometric)	Asarco	42	44264
Carbon Monoxide RFCA-0276-008	8501-5CA (NDIR)	Bendix	41	7450
RFCA-0876-012	866 (NDIR)	Beckman	41	36245
RFCA-0177-018	202S (NDIR)	Mine Safety	42	5748

TABLE 5 (cont)

LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS
(12-31-77)

Designation Number	Identification	Source	Federal Register Notice	
			Vol.	Page
Ozone				
RFOA-1075-003	QA 325-2R (Chemiluminescence)	Meloy	40	54856
RFOA-1075-004	QA 350-2R (Chemiluminescence)	Meloy	40	54856
RFOA-0176-007	8002 (Chemiluminescence)	Bendix	41	5145
RFOA-1076-014	1100-1	McMillan	41	466747
RFOA-1076-015	1100-2			
RFOA-1076-016	1100-3 (Chemiluminescence)			
RFOA-1176-017	8410E (Chemiluminescence)	Monitor Labs	41	53684
EQOA-0577-019	1003-AH (UV Absorption)	Dasibi	42	28571
RFOA-0577-020	950A (Chemiluminescence)	Beckman	42	28571
EQOA-0777-023	PW9771 (UV Absorption)	Philips	42	38931
Nitrogen Oxides				
RFNA-0677-021	8440E (Chemiluminescence)	Monitor Labs	42	37434
RFNA-0777-022	8101-C (Chemiluminescence)	Bendix	42	37435
RFNA-0977-025	1600 (Chemiluminescence)	Columbia Scientific Instruments	42	46574
EQN-1277-026	Sodium Arsenite	Technicon	42	62972
EQN-1277-027	Method (3) --			
EQN-1277-028	(Auto-Analysis of Manually Collected Samples)			

3.4 QUALITY ASSURANCE PROGRAM

The Illinois Environmental Protection Agency's Quality Assurance Program for Ambient Air Monitoring had its conceptual beginning in November of 1974, with a submittal to the USEPA, Region V of a role document for Quality Assurance. This document was prepared as a result of a condition to the State of Illinois's Clean Air Act Maintenance Grant. This effort was followed in 1975 with a detailed developmental effort to formulate an Operations and Procedures Document for the actual implementation of the Quality Assurance Program. The formal Quality Assurance Program was begun in January, 1976 with the issuance of an annual inspection schedule for State and local agency air monitoring activities. In March, 1976, the final Quality Assurance Program document was completed and submitted to the USEPA, Region V for review and approval after developmental input was received from the Cook County and Chicago Departments of Environmental Control.

During the course of 1976, thorough, comprehensive inspections of the air monitoring activities of the Illinois EPA and local agencies were performed. These assessments were of multiple benefit, as they provided the Illinois EPA with an enhanced insight into the actual operating methods used in the various air monitoring programs in the State; permitted operational deficiencies and deviations from Federal Register requirements to be determined; motivated corrective actions, improved methods, and procedural changes; improved coordination between State and local agencies; established credibility and confidence in the objectives and goals of the Quality Assurance Program; and established a guideline for quality assurance activities at the State and local agency levels.

This year the IEPA Quality Assurance Program expanded in many aspects. Additional local agency and industrial network monitoring activities were included in the annual inspection schedule for the first time, increased emphasis was placed on audits of continuous monitoring instruments throughout the State, and new calibration equipment with increased accuracy and reliability was purchased. There has been greatly increased coordination between the State Agency and the local agencies in the development of Quality Assurance Programs which suit the particular agency needs and permit documented and traceable verification of the collected data. It is anticipated that comprehensive, productive, and completely documented quality assurance programs will be in force by December 31, 1978 in all of the air pollution agencies within the State of Illinois.

During 1977, 137 individual monitoring sites throughout the state was assessed in accordance with the annual inspection schedule, and a spotcheck inspection was conducted at two additional monitoring sites. The Quality Assurance Office completed an independent audit of CO monitors throughout the State, which had begun in the Chicago area during the latter part of 1976. A special audit was also conducted of 16 of the Illinois EPA ozone monitoring sites. In addition, the Quality Assurance Office again participated with the USEPA, Region V in an audit of noncontinuous sites operated by both the State and local agencies.

The State Interlaboratory Proficiency Testing Program, which was initiated in March of 1976, was continued through 1977. The program had been expanded over the year to include hi-vol filter weighing and the analysis of heavy metals, sulfates and nitrates, as collected on hi-vol filters. This program has been of continuing benefit in terms of ascertaining the degree of correlation between analyses performed by the participating laboratories.

It should be noted that those operational deficiencies, procedural errors, and noncompliance with Federal Register requirements which were discovered in the course of quality assurance inspections and audits, have been thoroughly evaluated in order to determine the extent of their effects on the validity of the data collected. The inspections and audits conducted during 1977 have caused specific deficiencies to be corrected, procedures to be improved, and methods optimized. The Quality Assurance Program has proven effective and valuable in permitting accurate definitive judgments of the validity of data collected from monitoring sites in the State. Through allocation of additional resources, and more frequent and in-depth inspections and audits, a better definition of data accuracy and precision is anticipated.

4.0 STATEWIDE SUMMARY OF AIR QUALITY DATA - 1977

4.1 AIR QUALITY DATA INTERPRETATION

Ambient air measurements are used as the basis for understanding and evaluating air quality. To ensure optimum use of these measurements, the Agency periodically reviews the deployment of sensors in its air monitoring network. Nevertheless, no finite number of samplers can completely document air quality. Ambient air pollution measurements should be used in conjunction with meteorological and emission data and mathematical modeling to yield a more comprehensive understanding of a given region.

In order to provide a uniform procedure for determining whether a sufficient amount of air quality data has been collected by a sensor in a given time period (year, quarter, month, day, etc.) to be representative of that time period, a minimum statistical culling criteria was developed.

In order to calculate an annual average for noncontinuous sites, a minimum of 20 samples is necessary. Each quarter must contain at least 5 samples and within any quarter, if one of the months has no samples, then neither of the other two months can have less than 2 samples.

To determine an annual average for continuous data 75% of the total possible yearly observations are necessary, i.e., a minimum of 6570 hours were needed in 1977. In order to provide a balance between the respective quarters, each quarter must have at least 1300 hours which is 20% of the 75% minimum annual requirement.

To calculate quarterly averages at sites which do not meet the annual criteria, 75% of the total possible observations in a quarter are needed, i.e., a minimum of 1647 hours in 1977.

Monthly averages also require 75% of the total possible observations in a month, i.e., 540 hours as a minimum.

Additionally, for short-term running averages (24 hour, 8 hour, 3 hour) 75% of the data during the particular time period is needed, i.e., 18 hours for a 24-hour average, 6 hours for an 8-hour average and 3 hours for a 3-hour average.

Data listed as not meeting minimum statistical culling criteria in this report were so noted after evaluation using the criteria above.

The criteria for calculating a valid annual average requires 75% of the number of hours in the year (6570 hours for 1977). Although short term averages (3, 8, 24 hours) have been computed for certain sites not meeting the annual criteria, these averages may not be representative of an entire year's air quality. In certain circumstances where even the 75% criteria is met, the number and/or magnitude of short term averages may not be directly comparable from one year to the next because of distributional differences.

For summary purposes, the data is expressed in the number of significant figures to which the raw data is validated. Extra figures may be carried in the averaging technique, but the result is rounded to the appropriate significant figures. For example, the values 9, 9, 10 are averaged to give 9; whereas the values 9.0, 9.0, 10.0 are averaged to 9.3. The raw data itself should not be expressed to more significant figures than the sensitivity of the methodology allows.

Five of the six National Ambient Air Quality Standards (NAAQS) -- suspended particulate (TSP), sulfur dioxide (SO₂), carbon monoxide (CO), photochemical oxidants and non-methane hydrocarbons (N-MHC) -- have short-term ambient air concentrations (24 hours or less) not to be exceeded more than once per year. The standards are promulgated in this manner in order to protect the public from excessive levels of pollution both in terms of acute and chronic health effects.

Air pollution itself is a highly variable phenomenon. Some of the factors effecting pollution concentrations are (a) meteorological: atmospheric stability, wind speed and direction, precipitation, solar radiation, temperature, etc.; (b) geographical: urban or rural, valleys or plains and (c) economic: concentrations of industries, boom or recession, weekday or weekend. These variations often can be discerned as a pattern on a diurnal, seasonal or longer range basis.

Interpretation of data must necessarily consider the question of how well the air quality data represents the actual air quality. Certain statistical procedures are useful in describing and interpreting air quality data. Some of the formulas used in the compilation of this report, along with examples of their use, are given in Appendix A.

It is generally assumed that, if an instrument monitors continually, at the end of the year the air quality at that site is completely specified to within the accuracy of the instrument. However, monitors for suspended particulates and the SO₂/NO₂ bubblers operate on a noncontinuous basis--generally once every six days or in some cases every three or every twelve days. In these situations, there is a question

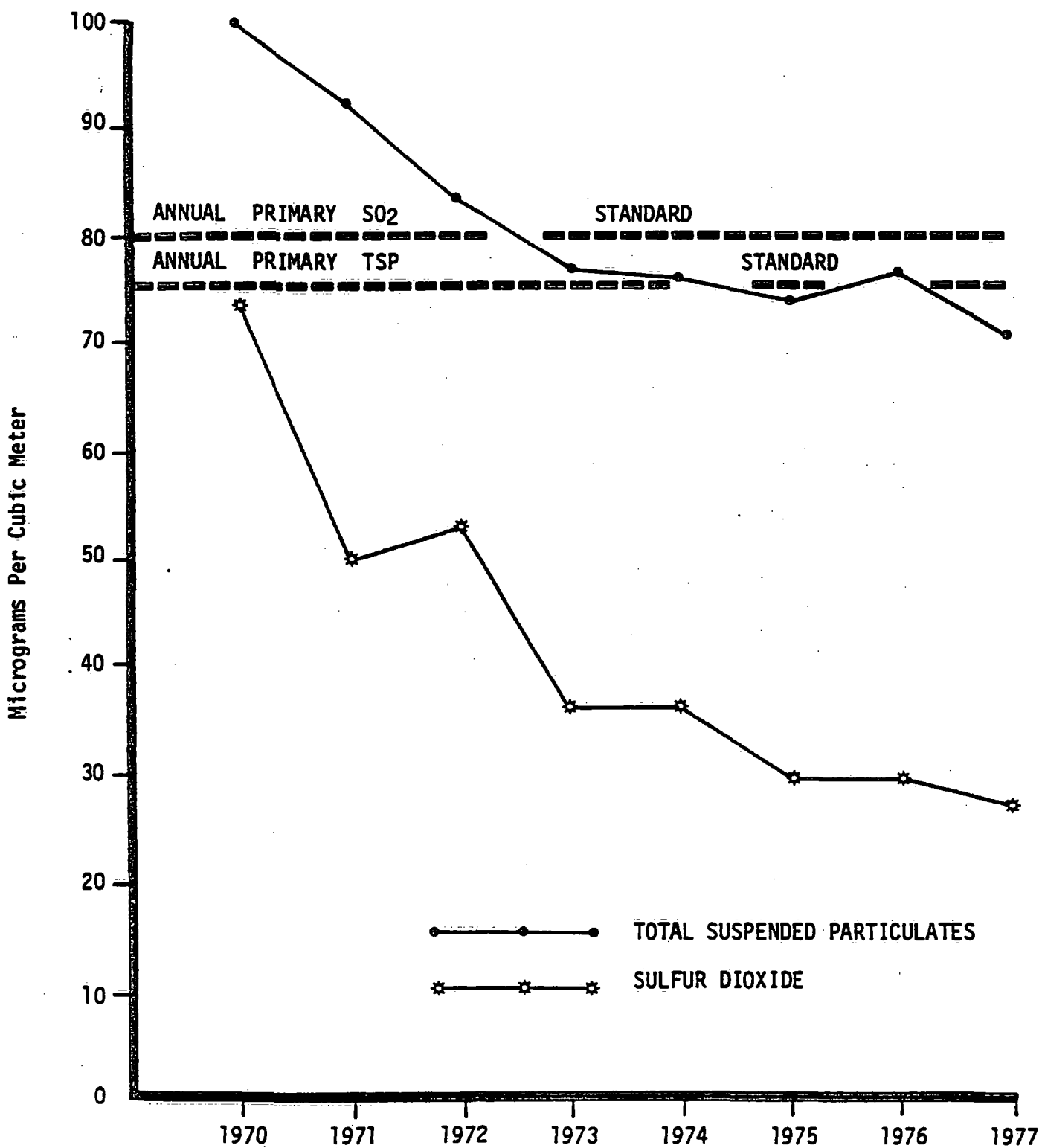
regarding how well the non-continuous data describes the air quality on days when monitoring is not conducted. Following Hunt (1972), confidence intervals can be determined for the noncontinuous data with the resultant true annual mean falling within a determined range at this specified confidence level.

Larsen (1971) indicates that the distribution of pollutant concentrations measured throughout the year is in many instances log-normal, i.e., the logarithm of the concentrations follows the well known normal distribution. Thus normal statistics can be applied to these cases. The pertinent parameters used in describing a log-normal distribution are the geometric mean, which specifies the central tendency (50th percentile point) of the values and the geometric standard deviation which specifies the spread of the distribution. A large geometric standard deviation indicates a large spread in the data. As an example, if every value for the year was identical, there would be no spread and the geometric standard deviation would be 1.0.

Once data has been compiled over a period of years, it is possible to determine trends mathematically. The Daniel's Test using the Spearman Rank Correlation Coefficient as described and recommended in Guidelines for the Evaluation of Air Quality Trends (OAQPS No. 1.2-014) can be used for these determinations. (See Appendix A for an example calculation using this method). A minimum of four years of valid data are required to use this method. A significant result either upward or downward indicates only the consistency of the direction of the change and not the magnitude of the change. In order to estimate the magnitude of the trend, it is necessary to apply a linear regression (least-squares fit) to the data. The result is the average rate of change over the time period of interest. Care should be exercised in the use of calculated trends. The factors contributing to the existence or absence of a trend at one site could be totally different than those contributing at another site. In fact, over a period of years, a site can show no trend by the statistical technique mentioned above, and yet have an overall decrease in concentration levels. This would indicate that the direction of the yearly changes have not been consistent. Thus each site should be completely analyzed before final conclusions are drawn.

FIGURE 1

STATEWIDE POLLUTION TRENDS*



*Arithmetic average of annual geometric means of all sites which have valid annual averages in each year.

4.2 TOTAL SUSPENDED PARTICULATE SUMMARIES

Figure 1 shows the statewide trend for suspended particulates from 1970 through 1977. The statewide average in each year is an arithmetic mean of the annual geometric means of all sites having valid annual averages in that year (see section 4.1). The eight year trend since 1970 is downward. The magnitude of the trend was greater from 1970 through 1973 than it has been for the period from 1973 to the present. The statewide average for 1977 was 70 ug/m^3 compared to 76 ug/m^3 in 1976. Running geometric means from the fourth quarter 1976 through the first three quarters 1977 indicated a statewide average of 75 ug/m^3 , consistent with that of 1976. Thus, the difference in the statewide average between 1976 and 1977 is strictly the result of lower concentrations existing in the fourth quarter of 1977 compared to the same time period in 1976.

Table 6 is the ranking (highest to lowest) of the 130 sites having valid annual averages in 1977. Of these 130 sites, 42 (32%) are in excess of the primary annual standard of 75 ug/m^3 and another 32 (25%) are in excess of the annual secondary standard of 60 ug/m^3 . In comparison to 1976, the number of sites in excess of the annual secondary standard (but not in excess of the annual primary standard) decreased by 8%; while the number of sites in excess of the annual primary standard decreased by 7%.

The highest annual average was 186 ug/m^3 recorded at 2001 East 20th Street in Granite City. This site has had the highest annual average in the state since 1972. The second highest site was Washington High School, in Chicago, with 170 ug/m^3 . The lowest annual mean was 39 ug/m^3 recorded in Evanston and Winnetka.

Table 7 lists the sites recording excursions of the 24-hour primary standard of 260 ug/m^3 , the date of the excursion, and the concentration. During 1977, data were collected from 157 sites. Data from all of these sites were reviewed during the preparation of this table, although it may have represented only a portion of 1977. Thus, sites may be listed in Table 7 as exceeding the 24-hour primary standard but not in the table of rankings (Table 6) because of the lack of a sufficient number of samples to determine an annual average. Summarized on this basis a total of 41 sites (26%) recorded at least one excursion of the 24-hour primary standard. Of these 41 sites, 19 (12% of the total) recorded more than one excursion and thus are in violation of the standard. May was a particularly bad month with over one half of the sites that recorded excursions during the year recording at least one and approximately 25% of all excursions being recorded during this month. May was also unusual meteorologically in that it was much warmer and drier than normal. Several periods of stagnating conditions occurred resulting in poor dispersion. In addition, on January 28, during blizzard conditions eight sites in Chicago recorded excursions and many other sites in Chicago recorded concentrations in excess of 200 ug/m^3 . Unfortunately, only sites in Chicago were operating on that day so it is not known whether the situation occurred statewide.

The largest number of excursions of the 24-hour primary standard was 19 (18 violations) at Washington High School in Chicago, followed by 16 excursions (15 violations) at 2001 East 20th Street in Granite City and 11 excursions (10 violations) in Oglesby. Because of the different sampling schedules of these sites, the average number of sampling days between excursions should be used to normalize the results. On this basis 2001 East 20th Street in Granite City had 3.4 sampling days between excursions, Washington High School in Chicago had 5.9 and Oglesby had 10.5.

The highest 24-hour concentration recorded in Illinois in 1977 was 1106 $\mu\text{g}/\text{m}^3$ at Washington High School in Chicago. This site recorded a total of four values in excess of 600 $\mu\text{g}/\text{m}^3$. The highest concentration next to Washington High School, was 592 $\mu\text{g}/\text{m}^3$ recorded at 2001 East 20th in Granite City.

4.3 SULFUR DIOXIDE SUMMARIES

Figure 1 shows the statewide trend for sulfur dioxide from 1970 through 1977. The statewide arithmetic average in each year is based on all sites having valid annual averages in that year. The trend has been definitely downward over the whole period with a leveling off since 1975. In 1977, the statewide average was 27 $\mu\text{g}/\text{m}^3$ well below the primary annual standard of 80 $\mu\text{g}/\text{m}^3$.

A total of 74 sites recorded valid annual averages for sulfur dioxide in 1977. The ranking of the annual averages (highest to lowest) is given in Table 8. The results in this Table are based on both continuous instruments (obtaining hourly averages) and gas bubblers (obtaining discrete 24-hour integrated samples). Of the 74 total sites, 24 are continuous and 50 are gas bubblers. By ranking, 16 of the highest 18 sites have continuous instruments. The relative ranking of sites throughout Table 8 may not be totally consistent, since studies have shown that the gas bubbler methodology, in field operation, produces a negative bias of as much as a factor of two. As a result, the Illinois EPA has discontinued the use of gas bubblers at the end of the calendar year 1977. In 1977 as in 1976, no sites were in excess of the annual primary standard; the highest average being recorded at Wood River with .025 ppm.

Table 9 lists the sites, time periods, and maximum concentrations when excursions of the 24-hour primary standard of 0.14 ppm were recorded. A total of six sites recorded at least one excursion of the standard but only one, Pekin, recorded more than one excursion (2 excursions resulting in 1 violation) and as such, is in violation of the standard. The highest 24-hour average was 0.228 ppm also recorded in Pekin. Sites in Blue Island and Wood River, which historically have recorded several excursions of the 24-hour standard in past years, recorded only one excursion each in 1977. There were no excursions of the 3-hour secondary standard recorded in the statewide (non-industrial) network.

4.4 NITROGEN DIOXIDE SUMMARIES

A total of 60 sites had valid annual averages for nitrogen dioxide in 1977. Table 10 lists the rankings (highest to lowest) of those sites. 1977 is the first year since nitrogen dioxide has been monitored in Illinois that no sites were in violation of the annual standard; one site, G.S.A. Building in Chicago equaled the standard but was not in violation. A total of 14 sites had annual averages in excess of 0.04 ppm. This result contrasts with 1976 when only 4 sites were in excess of 0.04 ppm. The following table lists the statewide average nitrogen dioxide concentrations since 1973.

Year	1973	1974	1975	1976	1977
Statewide Average (ppm)	.031	.028	.030	.028	.033

The average has remained constant with minor fluctuations throughout the period.

In Table 10, 40 of the 60 sites are in the Metropolitan Chicago AQCR 67. Thus the statewide average is strongly biased to that area. In ranking, the first 37 sites are from AQCR 67 indicating that the greatest NO₂ concentrations exist in this region.

4.5 OZONE SUMMARIES

The most extensive ozone monitoring effort in Illinois history was conducted during the ozone season of April through October, 1977. A total of 35 locations had monitoring during at least part of the ozone season and generally complete coverage was provided at 32 of the sites. Ozone monitors were located in 9 of the 11 AQCR's with the most emphasis being given to the Metropolitan Chicago and St. Louis AQCR's.

The results of the 1977 monitoring again demonstrated the statewide nature of the ozone problem. Each of the 32 sites operating during the entire season recorded more than one excursion of the 1-hour primary standard of 0.08 ppm and as such was in violation of the standard. Overall, the 1977 ozone season was worse than past years with many more excursions of the standard being recorded and peak concentrations being generally equal to or greater than past years. In particular, as compared to 1976, there was a 135% increase in the average number of excursions per site.

One of the factors contributing to the increase was the unusual month of May 1977. Historically, the month of May has accounted for less than 10% of the total number of excursions during a season. However, in 1977 May accounted for over 40% of the annual excursions statewide. May was unusual meteorologically in that it was much warmer, had more sunshine and, had less precipitation than normal. In addition, there were three stagnation periods during the month. These factors are important in contributing to high ozone.

Quantitatively, Wood River had the largest number of excursions of the primary standard in the state with 388. The second highest number of excursions was 273 at Calumet City, followed by 261 at Kenwood High School in Chicago. The highest one-hour concentration ever recorded in Illinois was recorded at Waukegan with a value of .266 ppm. The only other site in the state to record hourly averages in excess of 0.200 ppm was Kenwood High School in Chicago with a maximum concentration of .241 ppm.

In 1977, major emphasis was placed on the issuing of ozone advisories to the public and the declaration of ozone alerts. During the period April 15th to October 15th a bulletin summarizing ozone conditions was transmitted each day to the news media in Illinois via a statewide weather teletype network. This Bulletin listed the highest ozone level reached on the previous day, the current day's high, a forecast for the next day, and a listing of all cities with ozone monitoring stations which had reached ozone advisory criteria that day. Advisory conditions occur when the ozone level reaches 70 parts per billion (ppb) for a two-hour average, and the weather forecast indicates that this level will reoccur the next day.

On 86 of 153 days, one or more cities were listed in the daily ozone summary as having reached advisory conditions and on 3 days all cities with monitors in the State were so listed. The City of Wood River, which is downwind of St. Louis, reached advisory conditions on 67 days during the year.

On twenty-one days during the year the ozone one-hour average rose above 170 ppb, the State's Yellow Alert level. On nineteen of these occasions the levels were not forecast to persist for 12 hours or reoccur the next day and therefore Yellow Alerts were not declared. On all nineteen occasions, the forecasts proved to be correct. In these cases, when yellow alert levels are reached but are not expected to persist or recur, the news media in the affected area are contacted and advised of the situation in order to provide warning to the Public.

On the two days during the year when the Yellow Alert level was reached and expected to recur the next day, Yellow Alerts were declared. These two ozone Yellow Alerts were the only actual air pollution episodes declared in Illinois during 1977. A summary of the Yellow Alerts follows.

Action During Ozone Yellow Alert Of May 19th, and 20th, 1977

On Thursday, May 19th, a slow moving high pressure system, had allowed an air mass to remain essentially unchanged in Illinois for 3 days, causing an increase in all air pollutants, especially in ozone. Sunny skies, warm temperatures, and light southerly winds dominated the State. The Kenwood High School Station in Chicago recorded a level of 207 ppb at 12 noon, followed by four hours above the Yellow Alert level. At 2:00 P.M., the Illinois EPA declared a Yellow Alert for Chicago south of the Stevenson Expressway and east of the Dan Ryan/Calumet Expressway. Ozone levels were elevated but did not exceed 170 ppb at Hillside, Calumet City and the Chicago Polk Street and Lindblom monitors.

Ozone concentrations dropped below the advisory level after sunset, that evening and on the 20th an approaching frontal system produced cloudy skies and thunderstorms. On this day, levels peaked at 1:00 P.M. at Kenwood with a reading of 86 ppb. At 2:00 P.M., May 20th, the Illinois EPA terminated the Yellow Alert but kept Chicago in "Ozone Advisory" status.

Actions during Ozone Yellow Alert of July 15th to 18th, 1977

On Friday, July 15th, ozone levels at the Wood River monitor climbed rapidly in the morning reaching 151 ppb at 11 A.M. Stagnant atmospheric conditions existed, with very warm temperatures and sunny skies.

Meteorologists from the National Weather Service, Murray & Trettle, (consultants of the Agency) and the Agency agreed that no significant change in conditions would occur during the next 24 hours. At 1:00 P.M., levels at Wood River reached 185 ppb, and a Yellow Alert for Madison County north of I-270, south of 140 and east of I-55 to the Mississippi River was declared. The Alert was effective until 6:00 P.M., the next day, July 16th.

On the 16th, ozone levels reached 178 ppb., and again the meteorologists forecasted no change, therefore the Yellow Alert was extended for 24 more hours - up to 6:00 P.M., July 17th.

A slight increase in windspeed on the 17th kept ozone levels slightly lower than on the previous two days, down to, 139 ppb, but since stagnant air was remaining in the area with no change forecasted, the Alert was continued another day.

On the 18th, ozone levels reached 127 ppb but this time wind speeds were forecasted to increase significantly and the Yellow Alert was terminated at 6:00 P.M. Wood River, however, was kept in "Ozone Advisory" status.

On Tuesday, July 19th, ozone levels were elevated, reaching 150 ppb, but because of the increased windspeed ozone concentrations remained below the Yellow Alert level.

4.6 CARBON MONOXIDE SUMMARIES

During 1977, excursions of the 8-hour primary standard of 9 ppm for carbon monoxide were recorded at four sites in Chicago and two sites in Granite City. All but one site, Chicago Daley Center, recorded more than one excursion and are in violation of the standard.

The highest number of excursions were recorded at two central business district (CBD) sites in Chicago: State Office Building with 74 excursions (73 violations) and CAMP Station with 30 excursions (29 violations). The State Office Building site was initiated in 1977, being established in late March, so that a complete year of data coverage was

not available. Compared to 1976 the CAMP Station recorded a factor of two increase in the number of excursions, from 16 to 30. The other Chicago site in violation, Sunnyside and Knox, recorded an increase in excursions from 2 in 1976 to 15 in 1977. The results from Granite City represent data from an instrument which was moved in August from 2301 Adams to a center-city traffic oriented location at 2001 Edison. Thus, the Edison site did not have a complete year of monitoring. The number of excursions was 1 (0 violations) at that location. Table 11 lists the dates, time periods, and maximum 8-hour averages for the excursions of the 8-hour carbon monoxide standard in 1977.

The highest 8-hour averages recorded in the state during the year were 16.0 and 14.6 ppm both recorded at the State Office Building in Chicago. Outside of Chicago, in Granite City the highest 8-hour average was 12.1 ppm.

There were no excursions of the 1-hour primary standard of 35 ppm. The highest 1-hour concentrations were 22.3 ppm at Medical Center, 22.1 ppm at State Office Building and 22 ppm at CAMP all in Chicago.

4.7 NON-METHANE HYDROCARBON SUMMARIES

Three monitoring stations in Illinois reported data for non-methane (reactive) hydrocarbons. The standard is a 6-9 a.m. (local time) average of 0.24 ppm not to be exceeded more than once a year. The standard is not health related but is designed to promote the achievement of the oxidant standard. In summarizing the data the number of 6-9 a.m. averages greater than 0.24 ppm were compared with the total number of valid 6-9 a.m. averages. The percent of days above the standard ranged from 41% at Springfield to 85% at the Medical Center in Chicago to 98% at Joliet. The highest 6-9 a.m. average was 3.9 ppm at the Medical Center in Chicago.

TABLE 6

1977
STATEWIDE TOTAL SUSPENDED
PARTICULATE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL GEOMETRIC MEAN (UG/M ³)
1	Granite City	2001 E. 20th	186
2	Chicago: Washington High School	3500 E. 114th St.	170
3	Granite City ¹	Norfolk & Western	133
4	Granite City	15th & Madison	131
5	Chicago: Addams Elementary School	10810 S. Ave. "H"	118
6	Granite City	23rd & Madison	112
6	Granite City ¹	23rd & Nameoki	112
8	McCook	50th St. & Glencoe	110
9	Granite City	2000 Edison	108
10	Granite City	Roosevelt & Rock Rd.	107
11	Decatur	Jasper & Orchard	101
11	McCook	Route 66 & Lawndale	101
13	Decatur	22nd & Geddes	97
14	Chicago: Cooley Vocational H. School	1225 N. Sedgwick	95
14	Wood River	54 N. Walcott	95
16	Oglesby	Non-Responsive	91
17	Bensenville	Main & York	88
17	Chicago: Anthony Elementary School	9800 S. Torrence Ave.	88
17	Chicago: Hale Elementary School	6140 S. Melvina Ave.	88
17	East Peoria	235 E. Washington	88
17	Peoria	2711 S.W. Jefferson	88
22	Rockdale	Well #2 Pump Station	87
23	Milan	125 W. 2nd Ave.	86
23	Peoria	610 N.E. Jefferson	86
25	Granite City	2040 Johnson Ave.	84
26	Cahokia State Park	Business Rte. 40	83
26	Chicago: Carver High School	801 E. 133rd Pl.	83
28	Chicago: Kelly High School	4136 S. California	81
28	Granite City	3201 E. 23rd	81
30	Chicago: Austin West High School	118 N. Central	80
30	Joliet	Joliet & Benton	80
30	Joliet	501 Ella	80
33	Chicago: Medical Center	1947 W. Polk	79
33	East Moline	915 16th Ave.	79
35	Alton	103 E. 3rd St.	78
35	Blue Island	12700 Sacramento	78
35	Chicago: GSA Building	538 S. Clark	78
35	Chicago: South Water Filter Plant	3300 E. Cheltenham	78
35	Summit	60th & 7th Ave.	78
40	Carbondale	306 W. Main St.	77
40	Chicago: Lindblom High School	6130 S. Walcott	77
42	Cicero	15th St. & 50th Ave.	76
-----Primary Standard-----			
43	Chicago: Chicago Vocational H.S.	2100 E. 87th St.	75
43	Collinsville	115 A. W. Main	75
45	Rock Island (RASN)	1528 3rd Ave.	74
46	Bedford Park	6535 S. Central	73
46	Chicago: Logan Square	2960 W. Cortland Ave.	73
46	Decatur	600 E. Garfield	73
49	Bloomington	301 W. Washington	72
49	Chicago: Fenger Jr. College	11220 S. Wallace	72
49	Columbia	208 S. Rapp	72
49	Springfield	224 W. Adams	72
53	Alton	2708 Edwards	71
53	Elmhurst	118 Schiller	71
55	Bradley	610 E. Liberty	70
55	Chicago: Taft High School	5625 N. Natoma	70
57	Chicago: Calumet High School	8131 S. May St.	69
57	Chicago: Stevenson Elementary School	8010 S. Kostner Ave.	69
59	Galena	311 S. Main St.	68
60	Decatur	750 E. Lake Shore Dr.	67
60	Harvey	157th & Lexington	67
62	Calumet City	755 Pulaski Rd.	66
62	Chicago: Kenwood High School	5015 Blackstone	66
62	Chicago: Lakeview High School	4015 N. Ashland	66
65	Chicago: Edgewater	5358 N. Ashland Ave.	65
66	Bedford Park	6700 S. 78th Ave.	64
66	Moline	619 16th Ave.	64
68	Bensenville	375 Meyer	63
68	Lockport	5th & Madison	63

¹ Special Purpose Site

TABLE 6 (CONT.)
1977
STATEWIDE TOTAL SUSPENDED
PARTICULATE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL GEOMETRIC MEAN (UG/M ³)
70	Arlington Heights	33 S. Arlington Heights Road	62
70	Chicago: Steinmetz High School	3030 N. Mobile Ave.	62
70	Mokena	10940 Front St.	62
70	Waukegan	106 Utica	62
74	Peoria	1604 Detweiller	61
	-----Secondary Standard-----		60
75	Marion	2209 W. Main St.	60
75	Rock Falls	101 12th Ave.	60
77	Chicago: VonSteuben High School	5039 N. Kimball Ave.	59
77	Franklin Park	3400 N. Rose St.	59
77	Mt. Vernon	601 N. 18th St.	59
77	Peoria	Bradley University	59
77	Plainfield	1005 Eastern	59
77	Wheaton	201 Ruber St.	59
83	DesPlaines	1755 S. Wolf Rd.	58
83	Depue	Non-Responsive	58
83	Galesburg	Main Street	58
83	Morton Grove	911 Waukegan	58
83	Naperville	175 Jackson St.	58
83	Petersburg	7th & Jackson	58
83	Rock Island	1400 25th Ave.	58
83	Romeoville	Naperville Road	58
91	Effingham	1015 S. Willow	57
91	Hillside	Wolf & Harrison	57
91	Quincy	9th & Vermont	57
94	Champaign	2125 S. First	56
94	Chicago Heights	Dixie Highway & 10th	56
94	DeKalb	200 S. 4th	56
94	Edwardsville	Main & Purcell	56
94	Elgin	1002 N. Liberty	56
94	Hennepin	Non-Responsive	56
94	Monee	432 E. Main St.	56
94	Niles	8955 Greenwood Ave.	56
94	West Chicago	128 W. McConnell	56
103	Flossmoor	999 Kedzie Ave.	55
103	River Forest	Lathrop & Oak Avenues	55
103	Rockford	126 S. 1st Street	55
103	Skokie	7701 Lincoln	55
107	Addison	130 W. Army Trail Road	54
107	Ottawa	211 E. Main	54
107	Wilmington	South Joliet St.	54
110	Chicago: Sullivan High School	6631 N. Bosworth	53
110	Moline	3600 23rd Ave.	53
110	Oak Park	834 Lake Street	53
113	Orland Park	133rd & LaGrange	52
113	Waukegan	2200 Brookside	52
115	Chicago: Crib	68th St. & Lake Michigan	50
116	Midlothian	15202 Crawford Ave.	49
116	Palatine	1000 Quentin Rd.	49
118	Park Forest	100 Park Ave.	48
118	Skokie	4401 Dempster	48
118	West Chicago	DuPage County Airport	48
121	Island Lake	Island Lake Grade School	47
122	Waukegan	Golf & Jackson	46
123	Crystal Lake	Franklin & Caroline	44
123	Rockford	2525 Ohio	44
125	Joliet	1216 Houbolt	43
125	Wilmette	9th St. & Central Ave.	43
127	Cary	1st Street & Three Oaks Road	41
128	Lake Bluff	121 E. Sheridan	40
129	Evanston	1454 Elmwood	39
129	Winnetka	112 Willow	39

TABLE 7

1977
TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS
OF THE 24-HOUR PRIMARY STANDARD OF 260
MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUE (UG/M ³)
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)			
<u>COOK COUNTY</u>			
Blue Island	12700 Sacramento	April 15	282
Calumet City	755 Pulaski Road	May 31	264
Chicago:			
Addams Elementary School *	10810 South Avenue "H"	January 28 April 16 May 13 May 22 May 31 July 15 July 21 September 13	329 279 269 304 351 385 297 342
Anthony Elementary School	9800 South Torrence Avenue	May 22	313
Calumet High School	8131 South May Street	September 7	278
Carver High School *	801 East 133rd Place	May 19 May 22	285 292
Chicago Vocational High School *	2100 East 87th Street	January 28 May 22	282 281
Cooley Vocational High School	1225 North Sedrick	August 26	373
Fenger Jr. College *	11220 South Wallace	January 28 May 22	291 277
Hale Elementary School *	6140 South Melvina Avenue	January 28 April 16 June 3	378 280 287
Kelly High School	4136 South California	July 9	374
Kenwood High School *	5015 Blackstone	January 28 April 4 May 22	300 261 309
Lindblom High School *	6130 South Wolcott Avenue	January 28 July 15	288 261
S. Water Filtration Plant *	3300 E. Cheltenham	March 26 May 22 June 3	269 319 405
Stevenson Elementary School *	8010 South Kostner Avenue	January 28 May 22	429 265
Taft High School	5625 North Natoma	August 29	276
Washington High School *	3500 East 114th Street	January 16 January 28 January 31 February 3 April 16 May 10 May 13 May 16 May 19 May 22 May 31 July 6	325 472 494 306 347 617 427 309 412 339 515 281

* This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 7 (CONT.)
1977
TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS
OF THE 24-HOUR PRIMARY STANDARD OF 260
MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUE (UG/M ³)
Washington High School * (Cont.)	3500 East 114th Street	July 12 October 13 October 31 November 6 November 12 November 18 December 9	284 265 688 447 601 1106 364
<u>DUPAGE COUNTY</u>			
Bensenville	Main and York	May 13	267
<u>KANKAKEE COUNTY</u>			
Bradley	610 East Liberty	May 31	281
<u>WILL COUNTY</u>			
Joliet	5 East Van Buren	May 13	368
Rockdale	Well #2 Pump Station	April 1	262
68 METROPOLITAN DUBUQUE INTERSTATE (ILL. - WIS. - IOWA)			
<u>JO DAVIESS COUNTY</u>			
Galena	311 South Main Street	September 12	376
69 METROPOLITAN QUAD CITIES INTERSTATE (ILL. - IOWA)			
<u>ROCK ISLAND COUNTY</u>			
Milan	125 West 2nd Avenue	May 31	300
Moline	619 16th Avenue	May 1	330
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)			
<u>MADISON COUNTY</u>			
Granite City *	23rd and Madison	March 2 March 8 March 26	385 276 270
Granite City	3201 East 23rd	May 13	302
Granite City *	2001 East 20th	January 31 February 18 February 24 March 8 March 14 May 13 May 31 June 30 July 6 July 18 August 5 September 16 September 22 November 9 November 15 December 21	295 329 406 485 310 328 272 469 328 292 310 280 272 417 478 592

* This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 7 (CONT.)
1977
TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS
OF THE 24-HOUR PRIMARY STANDARD OF 260
MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUE (UG/M ³)
Granite City *	15th and Madison	February 18 March 8	265 323
Granite City	Roosevelt and Rock Road	March 8	274
Granite City ¹ *	Norfolk and Western	January 31 February 15 February 18 May 25 June 18 December 6	408 274 362 363 278 359
Granite City ¹ *	23rd and Nameoki	April 28 May 4 May 13 May 16 August 5	288 341 417 340 351
Wood River *	54 North Walcott	July 18 July 24	372 437
<u>ST. CLAIR COUNTY</u>			
East St. Louis	7 Collinsville Avenue	May 19	361
71 NORTH CENTRAL ILLINOIS INTRASTATE			
<u>BUREAU COUNTY</u>			
DePue	Non-Responsive	May 31	267
<u>LaSALLE COUNTY</u>			
Oglesby *	Non-Responsive	January 23 February 2 February 8 February 16 February 21 March 8 April 16 June 2 July 3 October 4 December 29	396 357 311 280 430 334 355 333 412 278 395
Oglesby ¹ *	Non-Responsive	July 3 July 18 October 4 December 29	517 328 325 443
Oglesby ¹	Maple and Watson	August 28	270
72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)			
<u>MASSAC COUNTY</u>			
Metropolis	Massac County Hospital	June 8	350

* This site is in violation of the 24-hour Primary Air Quality Standard.

¹ Special Purpose Site

TABLE 7 (CONT.)
1977
TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS
OF THE 24-HOUR PRIMARY STANDARD OF 260
MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUE (UG/M ³)
73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILL. - WIS.)			
<u>DeKALB COUNTY</u>			
DeKalb	200 South 4th	May 13	435
75 WEST CENTRAL ILLINOIS INTRASTATE			
<u>MACON COUNTY</u>			
Decatur	22nd and Geddes	March 8	285
Decatur *	Jasper and Orchard	March 2	276
		March 14	293
		March 26	288
		April 1	262

* This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 8

1977
STATEWIDE SULFUR DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)
-----Primary Standard-----			.030
1	Wood River	54 N. Walcott	.025
2	Granite City	2301 Adams	.023
3	Calumet City	755 Pulaski	.02
3	Chicago Heights	Dixie Highway & 10th	.02
3	Hillside	Wolf & Harrison	.02
3	Peoria	Hurlburt & McArthur	.020
7	Alton	2708 Edwards	.019
7	Chicago G.S.A. Building	538 S. Clark	.019
9	East St. Louis	650 Missouri	.018
9	Pekin	272 Derby	.018
11	Chicago: (CAMP)	445 Plymouth	.017
11	Peoria	407 N.E. Adams	.017
13	Bedford Park	6535 S. Central	.016
13	Springfield ¹	712 S. Dirksen	.016
15	Cahokia	Business Rte. 40	.014
15	Chicago: Kenwood High School	5015 Blackstone	.014
15	Marion	2209 W. Main	.014
15	McCook	50th St. & Glencoe	.014
19	Chicago: Addams Elementary School	10810 S. Ave. "H"	.013
19	Chicago: Cooley Vocational High School	1225 N. Sedwick	.013
19	Chicago: Hale Elementary School	6140 S. Melvina	.013
19	Decatur	2760 N. 22nd St.	.013
23	Chicago: Medical Center	1947 W. Polk	.012
23	East Peoria	1167 W. Washington	.012
23	Granite City	2000 Edison	.012
23	Peoria	419 Fulton	.012
23	Waukegan	Golf & Jackson	.012
28	Chicago: Lakeview High School	4015 N. Ashland	.011
28	Rockford	1528 18th Ave.	.011
30	Chicago: Austin West High School	118 N. Central	.010
30	Chicago: Chicago Vocational H.School	2100 E. 87th St.	.010
30	Chicago: Steinmetz High School	3030 N. Mobile	.010
30	Chicago: Washington High School	3500 E. 114th St.	.010
30	Skokie	9800 Lawler	.01
30	Springfield	224 W. Adams	.010
36	Carbondale	306 W. Main	.009
36	Chicago: Crib	68th St. & Lake Michigan	.009
36	Chicago: Sullivan High School	6631 N. Bosworth	.009
36	LaSalle	541 Chartres	.009
36	Quincy	9th & Vermont	.009
41	Chicago: Anthony Elementary School	9800 S. Torrence	.008
41	Chicago: Carver High School	801 E. 133rd Pl.	.008
41	Galesburg	161 S. Cherry	.008
41	Joliet	Joliet & Benton	.008
45	Bensenville	375 Meyer	.007
45	Blue Island	12700 Sacramento	.007
45	Chicago: Edgewater	5358 N. Ashland	.007
45	Chicago: Fenger Jr. College	11220 S. Wallace	.007
45	Chicago: Lindblom High School	6130 S. Wolcott	.007
45	Chicago: Taft High School	5625 N. Natoma	.007
45	Cicero	15th St. & 50th Ave.	.007
35	Henry	Route 29	.007
45	Oak Park	834 Lake St.	.007
45	Peoria	1604 Detweiler	.007
45	Summit	60th & 74th Ave.	.007
56	Chicago: Kelly High School	4136 S. California	.006
56	Chicago: Stevenson Elementary School	8010 S. Kostner	.006
56	Peoria	2711 S.W. Jefferson	.006
56	Quincy	18th & Elm	.006
56	Waukegan	3010 Grand Ave.	.006
61	Chicago: South Water Filtration Plant	3300 E. Cheltenham	.005
62	Bedford Park	6700 S. 78th	.004
62	Champaign	2125 S. First	.004
62	Chicago: Calumet High School	8131 S. May	.004
62	Decatur	Franklin & Wood	.004
62	East Moline	915 16th Ave.	.004

¹Special Purpose Site

TABLE 8 (CONT.)
1977
STATEWIDE SULFUR DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)
62	Flossmoor	999 Kedzie	.004
62	Galena	311 S. Main St.	.004
62	Harvey	157th & Lexington	.004
62	Ottawa	211 E. Main	.004
62	Wilmette	9th St. & Central Ave.	.004
72	Des Plaines	1755 S. Wolf	.003
72	Morton Grove	9111 Waukegan	.003
72	Park Forest	100 Park Ave.	.003

TABLE 9

1977
SULFUR DIOXIDE IN EXCESS OF THE PRIMARY (24-HOUR)
AND SECONDARY (3-HOUR) SHORT TERM STANDARDS*

STATION	ADDRESS	DATE	AVERAGING TIME	NUMBER* OF EXCURSIONS	TIME PERIOD	MAXIMUM AVERAGE (PPM)
65 BURLINGTON-KEOKUK INTERSTATE (ILL. - IND.)						
<u>PEORIA COUNTY</u>						
Peoria	Glen Oak Park	December 12-13	24 hour	1	1300-1700	.149
<u>TAZEWELL COUNTY</u>						
Pekin ^a	272 Derby	January 28-30	24 hour	1	0800-0700	.228
		November 9-10	24 hour	1	0100-1700	.177
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)						
<u>COOK COUNTY</u>						
Blue Island	12700 Sacramento	March 8	24 hour	1	0000-2400	.158
Calumet City	755 Pulaski	April 15-16	24 hour	1	0400-0400	.15
Chicago:						
Camp	445 Plymouth	February 8-10	24 hour	1	2200-0300	.142
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)						
<u>MADISON COUNTY</u>						
Wood River	54 N. Walcott	February 7-9	24 hour	1	0800-0500	.194

*The 24-Hour Primary Standard is 0.14 parts per million; the 3-Hour Secondary Standard is 0.50 parts per million

^aThis site is in violation of the 24-hour Primary Air Quality Standard.

♦Non-overlapping averages greater than the Standard.

TABLE 10

1977
STATEWIDE NITROGEN DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)
1	Primary Standard		.05
2	Chicago: G.S.A. Building	538 South Clark	.050
3	Chicago: CAMP	445 Plymouth	.048
3	Chicago: Austin West High School	118 North Central	.047
5	Skokie	9800 Lawler	.047
6	Cicero	15th Street and 50th Avenue	.046
7	Oak Park	834 Lake Street	.045
7	Chicago: Cooley Vocational High School	1225 North Sedgwick	.044
9	Morton Grove	9111 Waukegan	.044
9	Chicago: Lakeview High School	4015 North Ashland	.043
11	Summit	60th and 74th Avenue	.043
12	Chicago: Kelly High School	4136 South California	.042
12	Chicago: Edgewater	5358 North Ashland	.041
12	Harvey	157th and Lexington	.041
12	Hillside	Wolf Road and Harrison	.041
15	Chicago: Lindblom High School	6130 South Wolcott	.040
15	Chicago: Medical Center	1947 West Polk	.040
15	Des Plaines	1755 South Wolf Road	.040
18	Blue Island	12700 Sacramento	.039
18	Chicago: Kenwood High School	5015 Blackstone	.039
18	Chicago: Steinmetz High School	3030 North Mobile	.039
21	Chicago: Addams Elementary School	10810 South Avenue "H"	.038
21	Chicago: Anthony Elementary School	9800 South Torrence	.038
21	Chicago: Chicago Vocational High School	2100 East 87th Street	.038
21	Chicago: Hale Elementary School	6140 South Melvina	.038
25	Chicago: Calumet High School	8131 South May	.037
25	Chicago: Taft High School	5625 North Natoma	.037
27	Chicago: Carver High School	801 East 133rd Place	.036
27	Chicago: Washington High School	3500 East 114th Street	.036
27	Wilmette	9th Street and Central Avenue	.036
30	Chicago Heights	Mixie Highway and 10th Street	.035
30	Flossmoor	999 Kedzie	.035
32	Calumet City	755 Pulaski	.034
32	Chicago: Sullivan High School	6631 North Bosworth	.034
34	Joliet	Joliet and Benton	.033
34	Park Forest	100 Park Avenue	.033
36	Chicago: Crib	68th Street and Lake Michigan	.032
36	Chicago: Stevenson Elementary School	8010 South Kostner	.032
38	Granite City	2000 Edison	.031
39	Chicago: South Water Filtration Plant	3300 East Cheltenham	.029
39	East St. Louis	650 Missouri	.029
41	Chicago: Fenger Junior College	11220 South Wallace	.028
42	East Moline	915 16th Avenue	.027
43	Bensenville	375 Meyer	.026
43	Waukegan	3010 Grand Avenue	.026
45	Peoria	419 Fulton	.025
46	Wood River	54 North Walcott	.024
47	Peoria	1604 DeWittier	.023
47	Springfield	224 West Adams	.023
49	East Peoria	1167 West Washington	.021
50	Decatur	Franklin and Wood	.020
50	Henry	Route 29	.020
50	Rockford	1528 18th Avenue	.020
53	Galesburg	161 South Cherry	.018
54	Peoria	2711 S. W. Jefferson	.017
55	Carbondale	306 West Main	.016
55	LaSalle	541 Chartres	.016
57	Champaign	2125 South First Street	.015
57	Marion	2209 West Main	.015
57	Quincy	18th and Elm	.015
60	Ottawa	211 East Main	.013

TABLE 11

1977
**CARBON MONOXIDE IN EXCESS OF THE 8-HOUR
 PRIMARY STANDARD OF 9 PARTS PER MILLION**

SITE	ADDRESS	DATE	TIME PERIOD	NUMBER OF 8-HOUR AVERAGES > 9 PPM*	MAXIMUM 8-HOUR AVERAGE (PPM)
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)					
<u>COOK COUNTY</u>					
Chicago:					
CAMP♦	445 Plymouth	February 22	0900-2400	1	11
		April 15-16	1500-0500	1	11
		May 2	0500-2100	2	11
		May 3	1200-2100	1	10
		May 4	0900-2100	1	10
		May 14	1100-1900	1	10
		May 20	0600-1900	1	10
		May 25	0600-2300	2	13
		May 26	1100-2100	1	10
		May 27	1000-1800	1	10
		June 5-6	1100-0100	1	12
		June 17	0900-2300	1	13
		June 24	1500-2400	1	10
		June 27	0400-1500	1	10
		July 7	0900-1900	1	10
		July 11	1100-2100	1	10
		July 13	1000-2200	1	10
		August 6-7	1400-0300	1	12
		September 1	0700-2200	1	11
		September 7	0500-1400	1	10
		September 13	0500-1700	1	10
		September 22-23	0900-0100	1	12
		September 30	0400-1900	1	12
		October 28	1000-2100	1	10
		November 7	1100-1900	1	13
		November 29	0600-1400	1	13
		December 13	1300-2100	1	10
		December 30	0200-1000	1	10
Daley Center	121 North LaSalle	February 7	0800-1700	1	10.0
State Office Building♦	160 North LaSalle	April 1	1000-1800	1	9.3
		April 18	0600-2000	1	11.8
		April 29	0300-1500	1	10.4
		May 2	0700-1700	1	9.8
		May 4	0600-1800	1	11.0
		May 5	0600-1900	1	10.2
		May 16	0600-1900	1	11.7
		May 17	0500-1600	1	10.2
		May 19	0400-1500	1	10.2
		May 20	0300-1700	1	12.4
		May 23	0400-1800	1	12.7
		May 24	0400-1700	1	11.6
		May 25	0500-1700	1	11.2
		June 6	0700-1700	1	9.5
		June 10	0600-1700	1	9.8
		June 13	0600-1800	1	10.5
		June 17	0500-2100	1	13.8
		June 24	0500-2000	1	10.9
		June 27	0200-1700	1	13.5
		June 28	0800-1600	1	9.5
		June 30	0500-1800	1	11.3
		July 6	0600-2000	1	11.4
		July 7	0600-1800	1	11.1
		July 8	0400-1900	1	12.4
		July 11	0500-2100	1	12.4
		July 12	0600-1900	1	11.1
		July 14	0300-2000	2	12.0
		July 15	0500-1800	1	10.2
		July 19	0500-2000	1	12.1
		July 20	0600-1800	1	9.7

*These are non-overlapping 8-hour averages

♦This site is in violation of the 8-hour Primary Air Quality Standard

TABLE 11 (CONT.)

1977

CARBON MONOXIDE IN EXCESS OF THE 8-HOUR PRIMARY STANDARD OF 9 PARTS PER MILLION

SITE	ADDRESS	DATE	TIME PERIOD	NUMBER OF 8-HOUR AVERAGES >9 PPM*	MAXIMUM 8-HOUR AVERAGE (PPM)
State Office Building* (Cont.)	160 North LaSalle	July 28	0500-1900	1	11.4
		July 29	0500-2100	1	12.1
		August 3	0300-2000	2	13.4
		August 8	0500-2100	1	13.4
		August 9	0500-2100	1	13.1
		August 10	0400-1700	1	10.8
		August 22	0600-1600	1	9.3
		August 24	0600-1900	1	10.6
		August 26	0500-2100	2	12.4
		August 30	0900-1800	1	9.4
		September 1	0400-1700	1	14.6
		September 2	0700-2000	1	10.3
		September 7	0500-1900	1	11.8
		September 8	0900-2100	1	10.4
		September 13	0400-2000	1	11.5
		September 16	0600-2200	1	11.7
		September 20	0900-2100	1	10.4
		September 21	0500-1700	1	10.2
		September 22	0800-2300	1	10.5
		September 29	0800-2000	1	9.7
		September 30	0300-1900	1	13.0
		October 19	0600-1800	1	10.6
		October 21	0700-1900	1	10.1
		October 26	0800-1700	1	9.3
		October 28	0900-2000	1	9.8
		November 1	0600-1900	1	10.1
		November 2	0500-2200	2	12.8
		November 3	0600-2200	2	12.0
		November 7	0600-2200	2	13.3
		November 8	0700-2100	1	14.5
		November 14	0800-2000	1	10.3
		November 29	0300-2100	2	16.0
		November 30	0900-1900	1	9.5
		December 5	1000-1900	1	9.3
		December 13	1000-2100	1	9.4
		December 29	0800-2000	1	9.8
		December 30	0300-1700	1	11.9
Sunnyside and Knox*	4632 West Sunnyside	February 25-26	0500-0800	3	10.5
		March 14-15	1200-0200	1	9.9
		March 14-15	2300-1000	0	9.2
		March 15-16	1500-1600	3	12.8
		March 17-18	0000-1200	4	10.9
		April 5	0400-1900	1	9.3
		April 15-16	1900-0800	1	10.5
		April 21	1100-2200	1	9.7
		August 29-30	2300-0800	1	9.6
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)					
MADISON COUNTY					
Granite City	2001 Edison	October 13	0300-1400	1	9.4

*These are non-overlapping 8-hour averages.

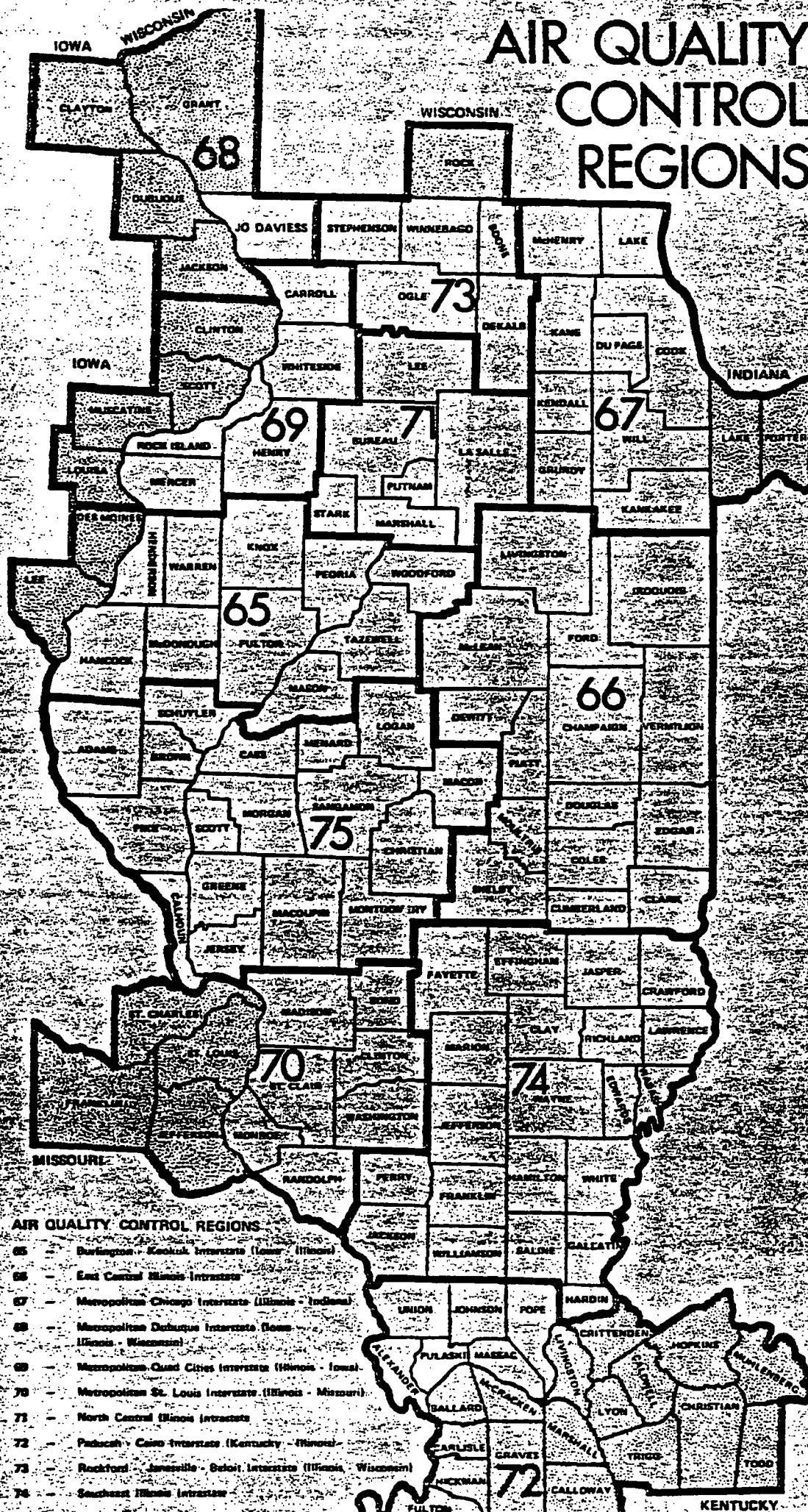
*This site is in violation of the 8-hour Primary Air Quality Standard.

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5.0

**1977 REGIONAL AIR
QUALITY DATA**

AIR QUALITY CONTROL REGIONS



65

66

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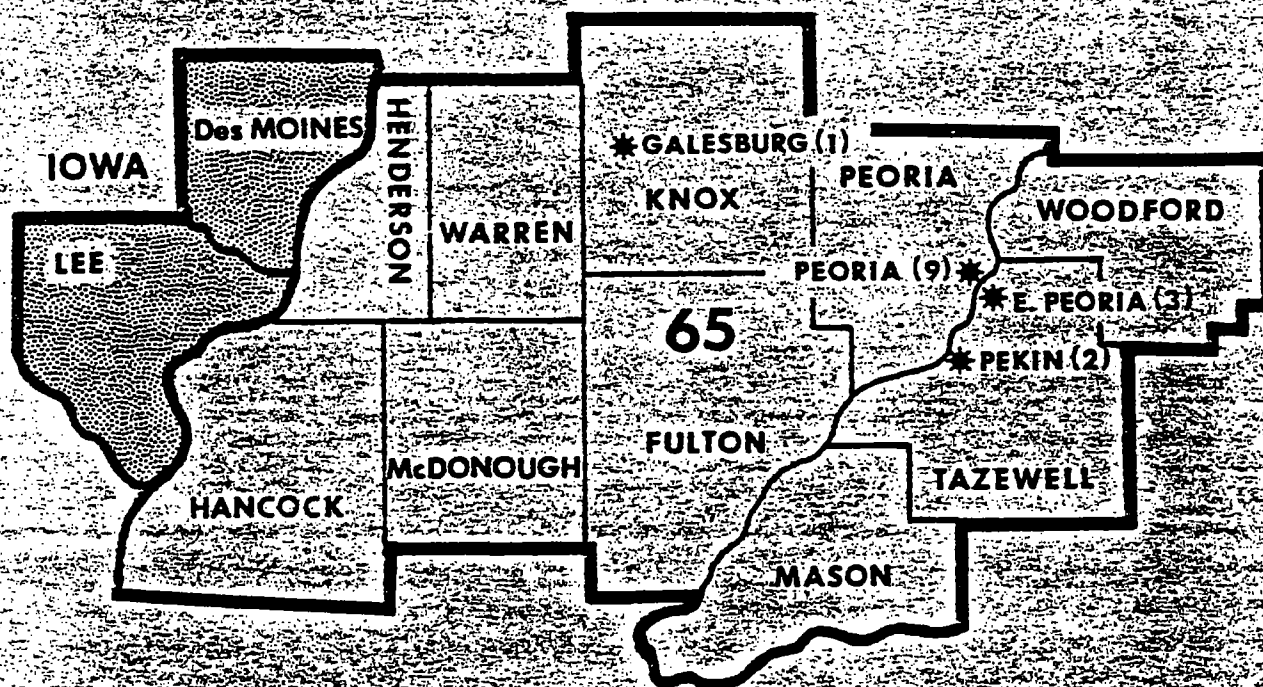
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**AIR QUALITY CONTROL REGION 65
BURLINGTON - KEOKUK INTERSTATE
(IOWA-ILLINOIS)**



Data for the Iowa portion of this control region can be obtained from:
Iowa Department of Environmental Quality,
3920 Delaware Avenue,
P. O. Box 3326,
Des Moines, Iowa 50316
(515) 265-8134

(The number of sampling sites in each city is shown in parenthesis following the city name.)

BURLINGTON-KEOKUK INTERSTATE (IOWA-ILLINOIS)
AIR QUALITY CONTROL REGION (AQCR) 65

TOTAL SUSPENDED PARTICULATES

Three sites out of the six recording valid annual averages for 1977 were in violation of the annual primary standard. The maximum annual average was 88 ug/m^3 measured at 2711 S. W. Jefferson in Peoria and at 235 East Washington in East Peoria. Of the sites in excess of the annual standard, none are showing downward trends; however, the means for all three sites were lower in 1977 than in 1976. Figure 2 is a map of the Peoria area listing the 1977 geometric mean for each site recording a valid average.

There were no excursions of the 24-hour primary standard recorded at any of the monitoring sites in AQCR 65 during 1977. This compares with 10 excursions recorded in the Region in 1976.

SULFUR DIOXIDE

None of the sites in this Region recorded annual averages in excess of the primary annual standard of .03 ppm; the highest annual average was .020 ppm recorded at Hurlburt and MacArthur in Peoria. Figure 3 is a map of the Peoria area listing the annual arithmetic means for those sites having valid averages. Two sites, Pekin and Glen Oak Park in Peoria, recorded excursions of the 24-hour primary standard of .14 ppm. Peoria-Glen Oak Park recorded only one excursion and, therefore, is not in violation of the standard; Pekin recorded two excursions and as such is in violation of the 24-hour standard. The highest 24-hour average was .228 ppm recorded in Pekin. There were no recorded excursions of the 3-hour secondary standard by any of the sites listed. However, one excursion of the 3-hour standard was recorded by an industrial monitor (see Section 6.0).

NITROGEN DIOXIDE

None of the five sites recording valid annual averages were in excess of the primary annual standard of .05 ppm. The highest annual average was .025 ppm which is only 50% of the standard.

OZONE

The only site monitoring ozone in AQCR 65, Hurlburt and MacArthur in Peoria, recorded 77 excursions of the 1-hour primary standard of .08 ppm during 1977. Approximately two thirds of these excursions occurred during the month of May. The highest 1-hour average recorded was .126 ppm.

CARBON MONOXIDE

The Peoria site located at 407 N. E. Adams did not record any excursions of either the 8-hour or 1-hour primary standards. The highest 8-hour average was 8.1 ppm and the highest 1-hour average was 18.1 ppm. In 1976 two excursions of the 8-hour standard were recorded at this site.

NON-METHANE HYDROCARBONS

Data not available for Illinois portion of this air quality control region.

PEORIA AREA

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)

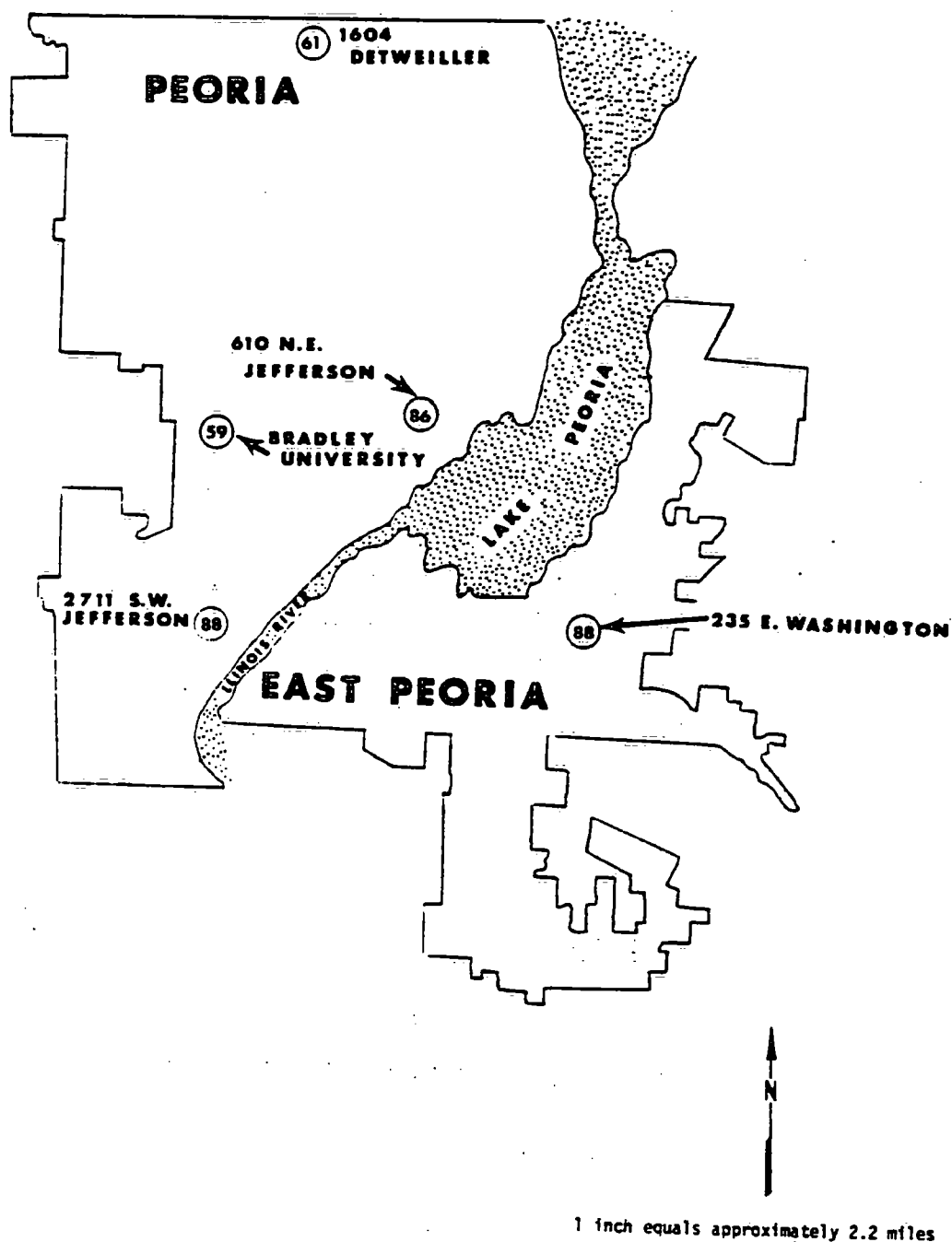


FIGURE 2

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PEORIA AREA

SULFUR DIOXIDE ANNUAL ARITHMETIC MEAN (PARTS PER MILLION)

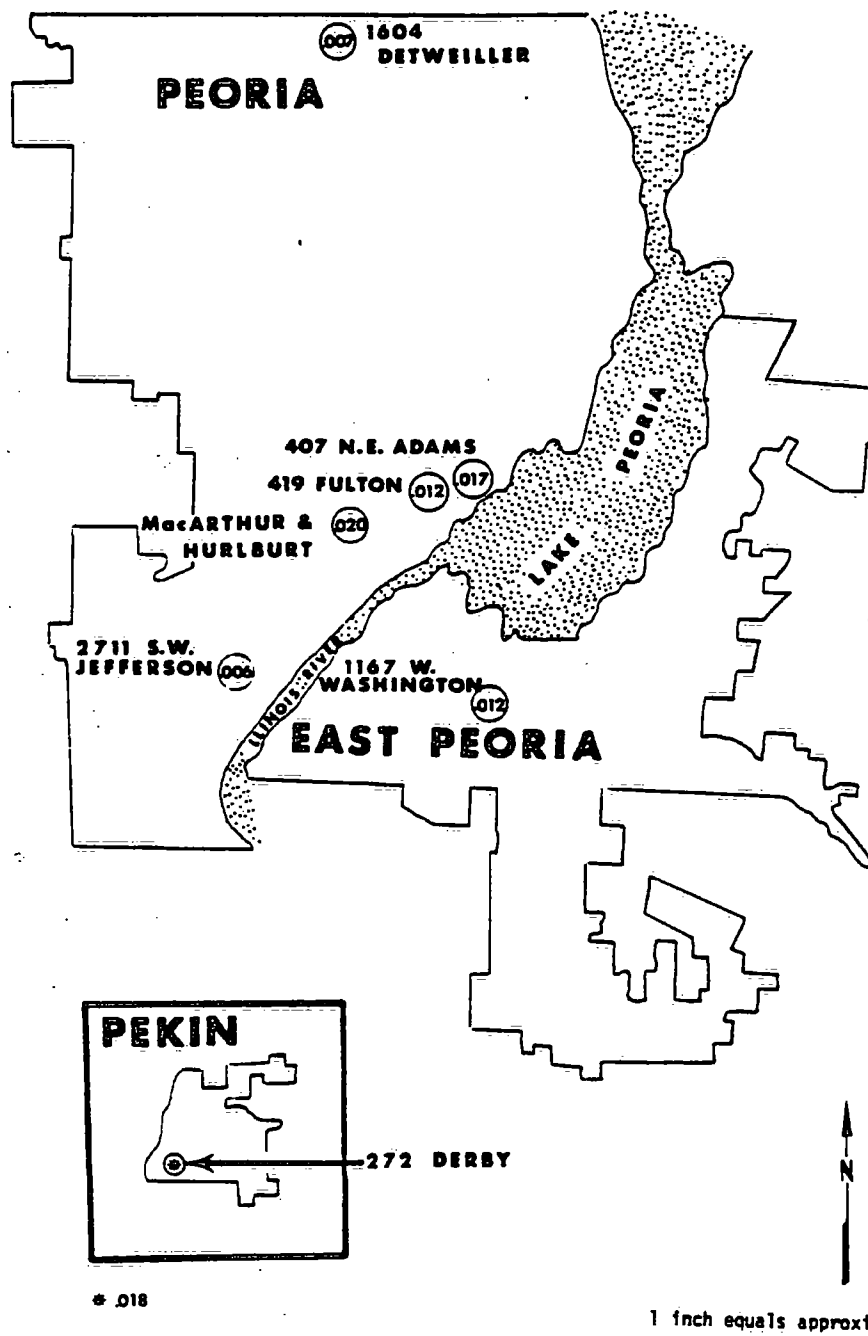


FIGURE 3

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG/M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>KNOX COUNTY</u>										
Galesburg	Main Street	50	2	0	249	196	134	124	58	1.77
<u>PEORIA COUNTY</u>										
Peoria	610 N. E. Jefferson	58	4	0	199	193	172	161	86	1.50
Peoria (RASN)	610 N. E. Jefferson	7	1	0	152	80	76	69	*	
Peoria	2711 S. W. Jefferson	57	6	0	226	178	171	165	88	1.61
Peoria	1604 Detweiller	58	1	0	173	135	124	113	61	1.60
Peoria	Bradley University	53	1	0	205	147	115	112	59	1.68
<u>TAZEWELL COUNTY</u>										
East Peoria	235 East Washington	52	4	0	190	169	165	151	88	1.43
Pekin	531 Court	27	0	0	149	128	121	120	*	

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>KNOX COUNTY</u>								
Galesburg	Main Street	-	71	66	67	73	67	58
<u>PEORIA COUNTY</u>								
Peoria	610 N.E. Jefferson	107	78	82	71	91	98	86
Peoria	2711 S.W. Jefferson	91	75	74	69	90	90	88
Peoria	1604 Detweiler	-	-	57	61	58	66	61
Peoria	Bradley University	-	-	*	54	70	65	59
<u>TAZEWELL COUNTY</u>								
East Peoria	235 East Washington	-	95	70	84	95	96	88
Pekin	531 Court	93	*	*	85	77	81	*

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

**1977
SULFUR DIOXIDE**
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3 - HR AVGS >.5	24-HR AVGS >.14	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
						1st	2nd	1st	2nd		
<u>KNOX COUNTY</u>											
Galesburg	161 South Cherry		36	NA	0	NA	NA	.052	.027	.008	2.60
<u>PEORIA COUNTY</u>											
Peoria (RASN)	610 N. E. Jefferson		6	NA	0	NA	NA	.043	.016	*	
Peoria	2711 S. W. Jefferson		51	NA	0	NA	NA	.028	.027	.006	2.34
Peoria	Hurlburt and MacArthur	7550		0	0	.450	.298	.124	.110	.020	2.62
Peoria	1604 Detweiller		54	NA	0	NA	NA	.048	.030	.007	2.51
Peoria	407 N. E. Adams	7111		0	0	.212	.178	.085	.070	.017	2.58
Peoria	419 Fulton		51	NA	0	NA	NA	.062	.042	.012	2.81
Peoria	Glen Oak Park	1344		0	1	.190	.184	.149	.041	*	
<u>TAZEWELL COUNTY</u>											
East Peoria	801 Springfield Road	1801		0	0	.154	.154	.038	.037	*	
East Peoria	1167 West Washington		55	NA	0	NA	NA	.111	.090	.012	3.03
Pekin	272 Derby	7067		0	2	.464	.403	.228	.177	.018	2.53

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>KNOX COUNTY</u>									
Galesburg	161 South Cherry		36	.019	.016	.014	.025	.018	1.54
<u>PEORIA COUNTY</u>									
Peoria (RASN)	610 N. E. Jefferson		6	.025	*	*	*	*	
Peoria	2711 S. W. Jefferson		53	.019	.018	.012	.018	.017	1.67
Peoria	1604 Detweiller		54	.036	.017	.016	.024	.023	1.82
Peoria	407 N. E. Adams	2572	*	*	*	*	.018	*	
Peoria	419 Fulton		52	.027	.026	.023	.026	.025	1.33
<u>TAZEWELL COUNTY</u>									
East Peoria	1167 West Washington		55	.022	.020	.020	.021	.021	1.47

NA - Not applicable

* - Did not meet minimum statistical culling criteria (see section 4.1).

**1977
OZONE**
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)									
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	ANNUAL	
												1st	2nd
<u>PEORIA COUNTY</u>													
Peoria	Hurlburt & MacArthur	5843	77	NS	.078	.125 (51)	.126 (14)	.099 (11)	.085 (1)	.072	.045	.126	.126

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

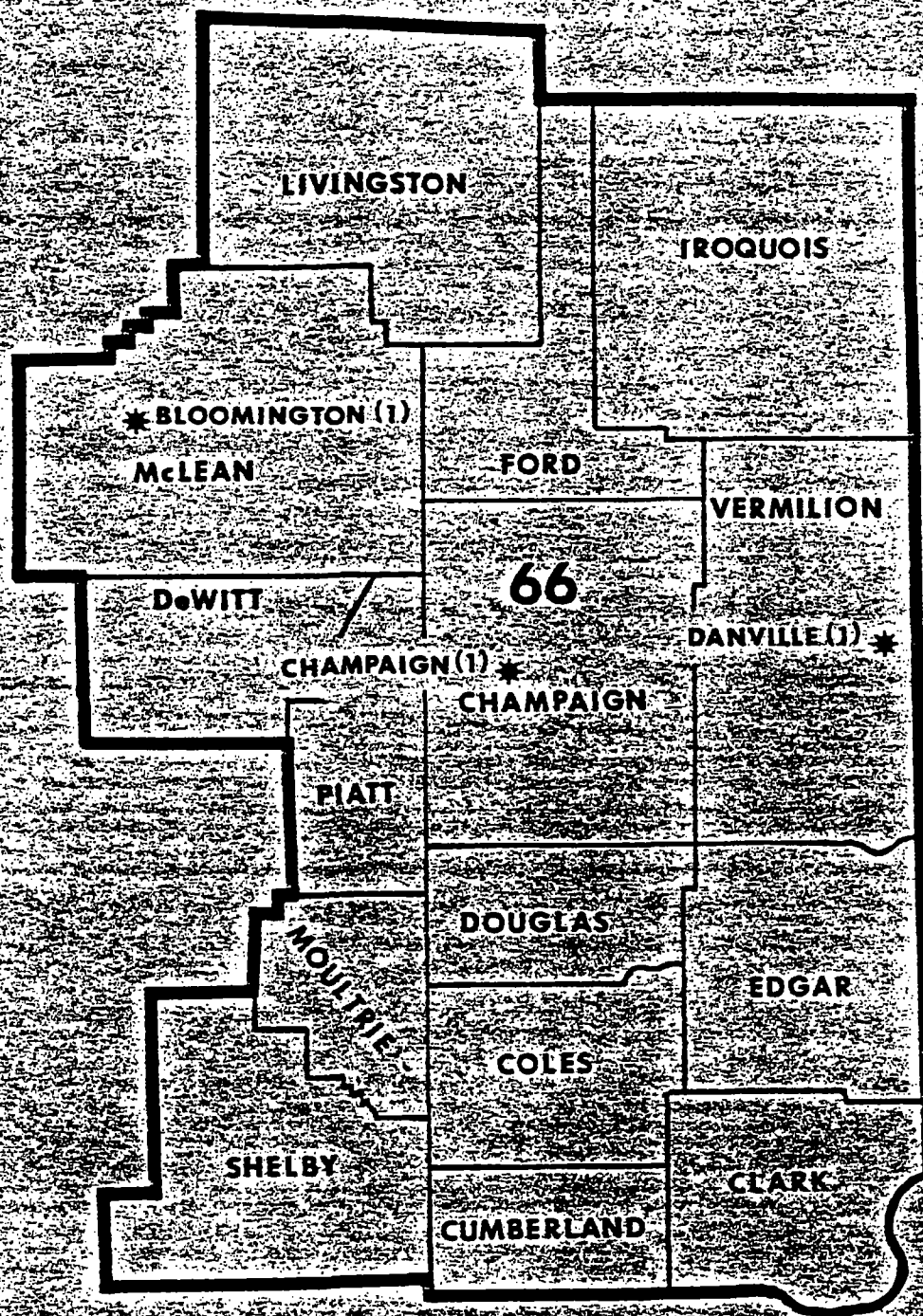
CARBON MONOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO OF SAMPLES	NUMBER OF AVERAGES		HIGHEST					
			1 - HR > 35 PPM	8 - HR > 9 PPM	1-HR AVERAGE			8-HR AVERAGE		
					1st	2nd	3rd	1st	2nd	3rd
<u>PEORIA COUNTY</u> Peoria	407 N. E. Adams	6706	0	0	18.1	12.9	11.3	8.1	7.7	7.3

NS - No samples

AIR QUALITY CONTROL REGION 66 EAST CENTRAL ILLINOIS INTRASTATE

66



(The number of sampling sites in each city is shown in parenthesis following the city name.)

EAST CENTRAL ILLINOIS INTRASTATE
AIR QUALITY CONTROL REGION (AQCR) 66

TOTAL SUSPENDED PARTICULATES

Both sites in AQCR 66, Champaign and Bloomington, recorded annual geometric means below the primary annual standard in 1977. Bloomington had the highest average with 72 ug/m^3 . Neither site recorded any 24-hour averages in excess of the 24-hour primary standard. The Bloomington site recorded the highest 24-hour sample in this Region with a value of 212 ug/m^3 .

SULFUR DIOXIDE

Only one site, Champaign, had a sufficient number and distribution of samples to have a valid arithmetic mean. The annual average was .004 ppm, well below the annual standard of .03 ppm. The highest 24-hour sample, .021 ppm, was recorded in Champaign.

NITROGEN DIOXIDE

The only site with a valid annual average, Champaign, recorded an annual average of .015 ppm, well below the annual standard of .05 ppm.

OZONE

The monitoring site in Champaign recorded 107 excursions of the 1-hour primary standard of .08 ppm. Since the monitoring site was established late in the 1976 ozone season, a comparison between 1976 and 1977 cannot be made. More than 80% of the total number of excursions were recorded in May and July. The highest 1-hour average was .106 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG/M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>CHAMPAIGN COUNTY</u> Champaign	2125 South First	51	1	0	157	137	132	129	56	1.61
<u>MCLEAN COUNTY</u> Bloomington	301 West Washington	50	2	0	212	184	146	138	72	1.55

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>CHAMPAIGN COUNTY</u> Champaign	2125 South First	-	-	-	-	46	56	56
<u>MCLEAN COUNTY</u> Bloomington	301 West Washington	84	96	53	58	64	75	72

- Site not in operation during year shown.

**1977
SULFUR DIOXIDE**
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR	24-HR	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS >.5	AVGS >.14	1st	2nd	1st	2nd		
<u>CHAMPAIGN COUNTY</u>											
Champaign	2125 South First		51	NA	0	NA	NA	.021	.013	.004	1.90
<u>McLEAN COUNTY</u>											
Bloomington	301 West Washington		44	NA	0	NA	NA	.013	.013	*	
<u>VERMILION COUNTY</u>											
Danville	4 North Vermilion		27	NA	0	NA	NA	.010	.007	*	

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>CHAMPAIGN COUNTY</u>									
Champaign	2125 South First Street		54	.017	.015	.014	.014	.015	1.78
<u>McLEAN COUNTY</u>									
Bloomington	301 West Washington		44	.022	.021	.022	*	*	
<u>VERMILION COUNTY</u>									
Danville	4 North Vermilion		27	.015	.014	.022	*	*	

OZONE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)										ANNUAL	
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT			1st	2nd
<u>CHAMPAIGN COUNTY</u>															
Champaign ¹	509 South Neil St.	3049	107	NS	NS	.106 (45)	.102 (17)	.103 (45)	.072	.061	.040			.106	.103

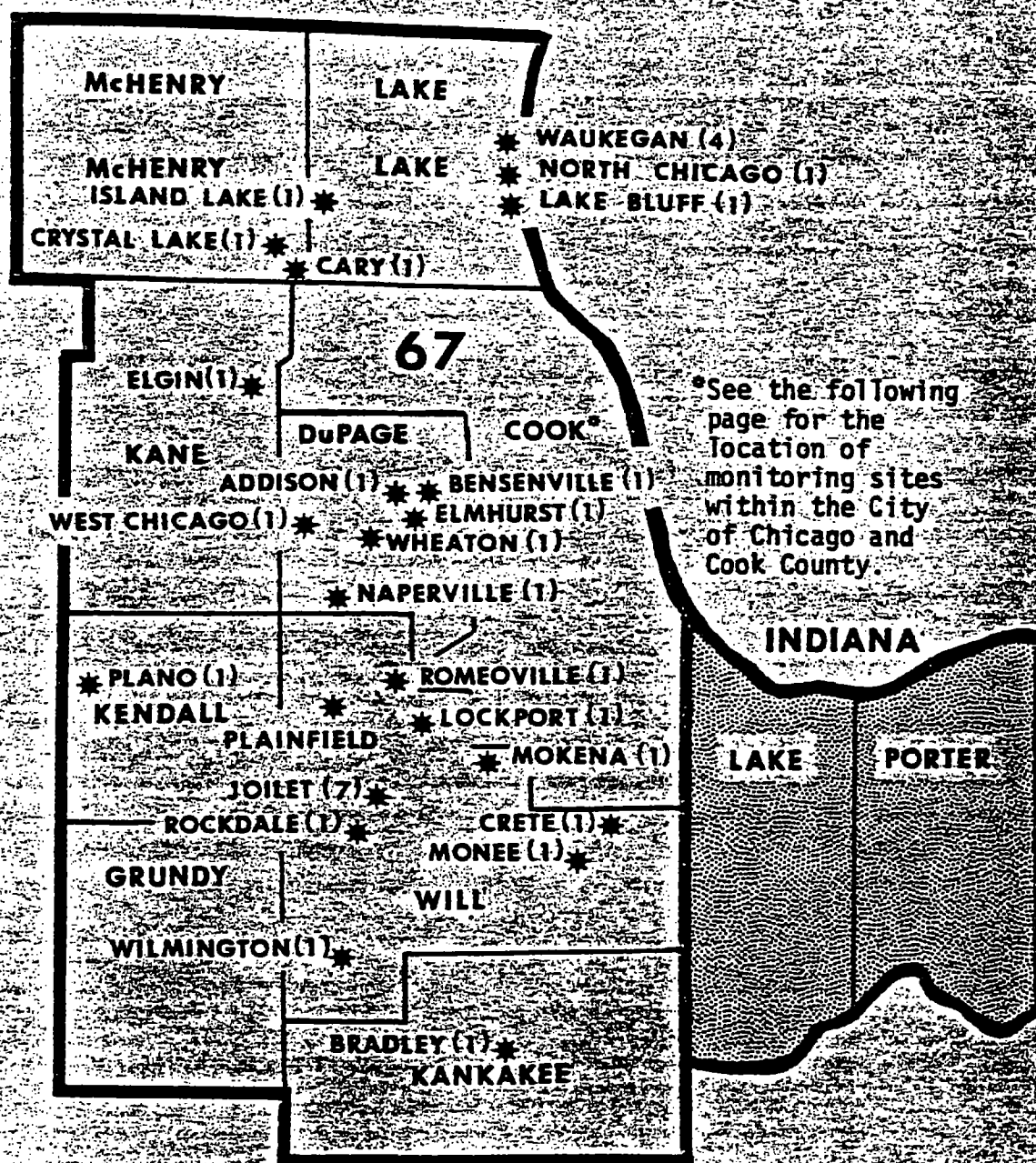
NS - No Samples
NA - Not applicable

* - Did not meet minimum statistical culling criteria (see section 4.1).

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

¹Special Purpose Site

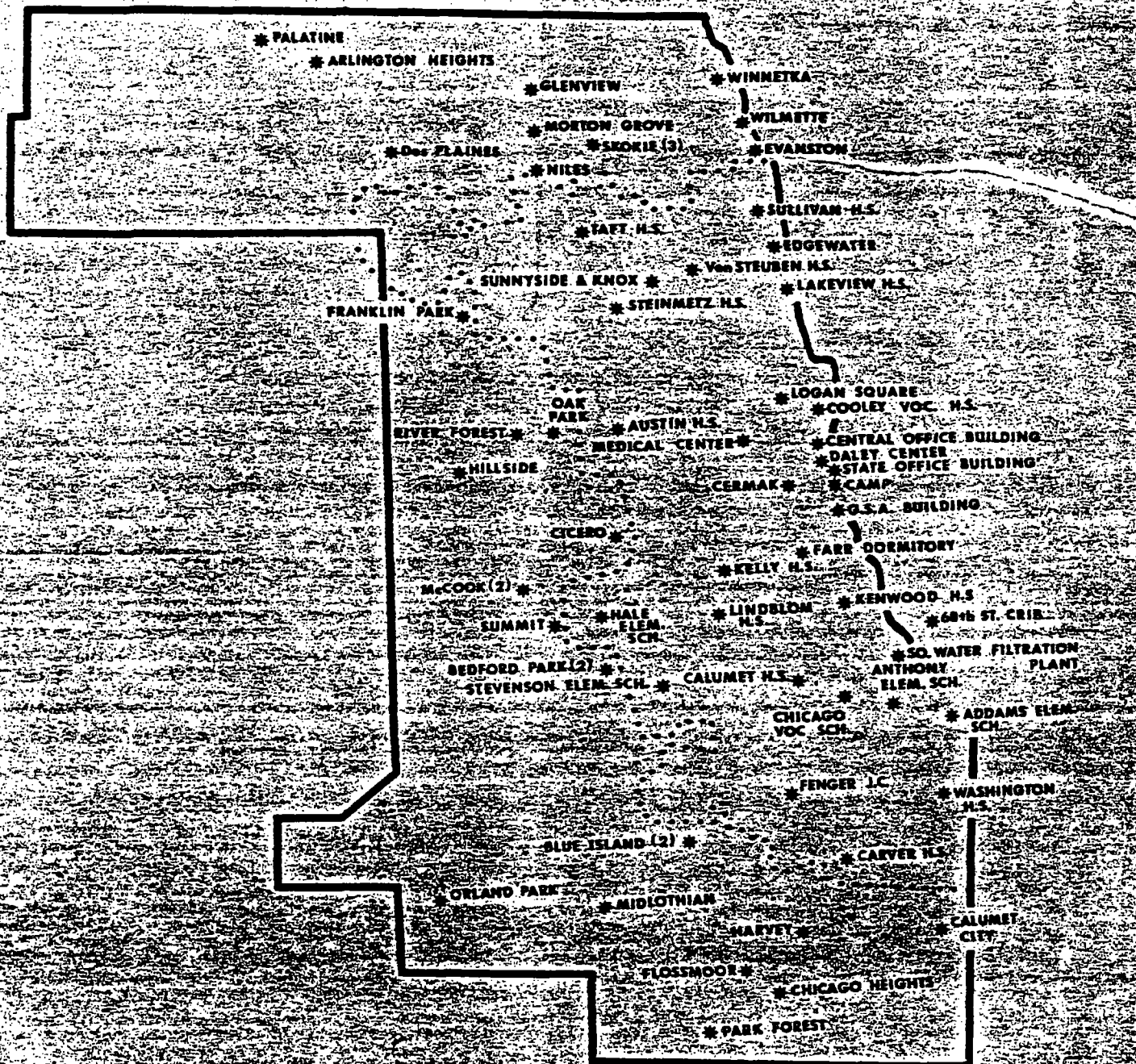
AIR QUALITY CONTROL REGION 67 METRO CHICAGO INTERSTATE (ILLINOIS-INDIANA)



Data for the Indiana portion of this control region can be obtained from:
Indiana Environmental Protection Agency,
Division of Air Pollution Control,
1330 West Michigan Street,
Indianapolis, Indiana 46206
(317) 633-0600

(The number of sampling sites in each city is shown in parenthesis following the city name.)

COOK COUNTY INCLUDING CHICAGO



(The number of sampling sites in each city is shown in parenthesis following the city name.)

METROPOLITAN CHICAGO INTERSTATE (ILLINOIS-INDIANA)
AIR QUALITY CONTROL REGION (AQCR) 67

TOTAL SUSPENDED PARTICULATES

A total of 80 sites in AQCR 67 recorded sufficient data for the computation of valid annual averages. Of these 80 sites, 21 (26%) had geometric means in excess of the primary annual standard. On a percentage basis this represents a 6% drop from 1976. In the City of Chicago 12 out of 25 sites (48%) were in violation of the primary annual standard compared with 54% in 1976. In Cook County outside of Chicago 5 out of 28 sites (18%) were above the primary annual standard while 19% were above the standard in 1976. The remaining four sites with values above the standard are located in Will County (3 sites) and in Bensenville (1 site). As a comparison of the magnitude of the changes from 1976 to 1977 for the 21 sites above the annual primary standard, the annual average for 8 sites decreased more than 5 ug/m^3 ; 4 increased more than 5 ug/m^3 ; and the remaining 9 did not change either way by more than 5 ug/m^3 . Figures 4 and 5 are maps of Cook County, including Chicago, and the Joliet area showing the annual geometric means.

A total of 10 sites recorded violations (more than one excursion) of the 24-hour primary standard of 260 ug/m^3 . All of the sites having violations were in the City of Chicago. However, 3 of the 10 sites with violations recorded one of their two excursions (resulting in the violation) on January 28 during blizzard conditions. Washington High School in Chicago recorded the most excursions with 19 and the highest 24-hour average (in both the AQCR and the State) with a value of 1106 ug/m^3 .

SULFUR DIOXIDE

A total of 44 sites recorded sufficient data to obtain valid annual averages. The highest annual averages were .02 ppm recorded in Calumet City, Chicago Heights and Hillside. Figure 6 is a map of Cook County, including Chicago, listing the valid annual averages.

Three sites, Blue Island, Calumet City, and Chicago-CAMP, recorded single excursions (no violations) of the 24-hour primary standard of .14 ppm. Blue Island recorded the highest 24-hour average with a value of .158 ppm. There were no excursions of the 3-hour secondary standard of .5 ppm.

NITROGEN DIOXIDE

The continuous Air Monitoring Program (CAMP) station in Chicago again recorded the highest nitrogen dioxide value in the State. However, an inconsistency has arisen since the gas bubbler value (.057 ppm) is significantly different than the value (.048 ppm) obtained from the

continuous monitor (8,322 hours of data) even when the effect of the sampling schedules is taken into account. At this time, the continuous monitor would be favored over the gas bubbler since the quality control and quality assurance aspects of its operation have shown the data to be reliable while the same analysis has not been made of the gas bubbler.

The G.S.A. Building in Chicago had a mean of .050 ppm, equal to the standard but not a violation.

OZONE

Ozone was monitored at 21 sites during at least part of the summer of 1977. Calumet City recorded the largest number of excursions of the 1-hour standard with 273, followed by Kenwood High School in Chicago, with 261. All sites that operated during the entire ozone season recorded at least two excursions and are in violation of the 1-hour primary standard of .08 ppm.

Waukegan measured the highest 1-hour average ever recorded in the State during 1977 with a value of .266 ppm. The only other site to record values in excess of .200 ppm was Kenwood High School in Chicago with a maximum average of .241 ppm.

CARBON MONOXIDE

A total of four sites, out of the twelve which reported carbon monoxide data, recorded excursions of the 8-hour primary standard of 9 ppm. Three of these four sites recorded more than one excursion and are in violation of the standard. A newly established central business district (CBD) site at 160 North LaSalle Street in Chicago, which began operation in April, 1977, recorded the most excursions of the 8-hour standard with 74 (73 violations). That same site also recorded the highest 8-hour average with a value of 16.0 ppm.

There were no values in excess of the 1-hour primary standard of 35 ppm. The highest 1-hour average was 22.3 ppm recorded at the Medical Center in Chicago.

NON-METHANE HYDROCARBONS

Two sites in Region 67 monitor for non-methane hydrocarbons. The Medical Center site recorded violations on 85% of the days with valid 6-9 a.m. averages, while the site in Joliet recorded violations on 98% of the days. The highest average was 3.9 ppm recorded at the Medical Center in Chicago.

COOK COUNTY INCLUDING CHICAGO

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN (MICROGRAMS PER CUBIC METER)

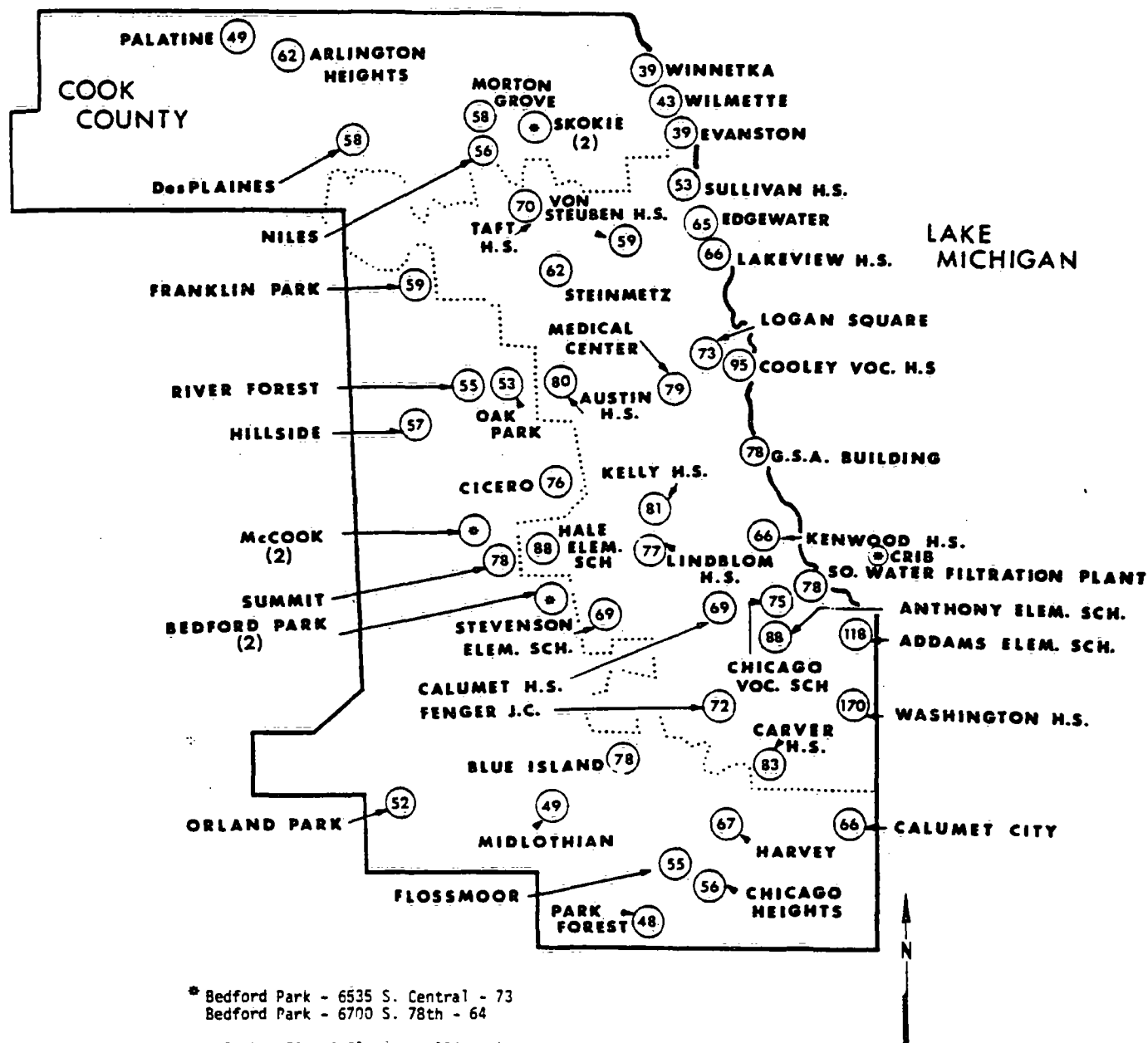


FIGURE 4

JOLIET
TOTAL SUSPENDED PARTICULATES
ANNUAL GEOMETRIC MEAN
(MICROGRAMS PER CUBIC METER)

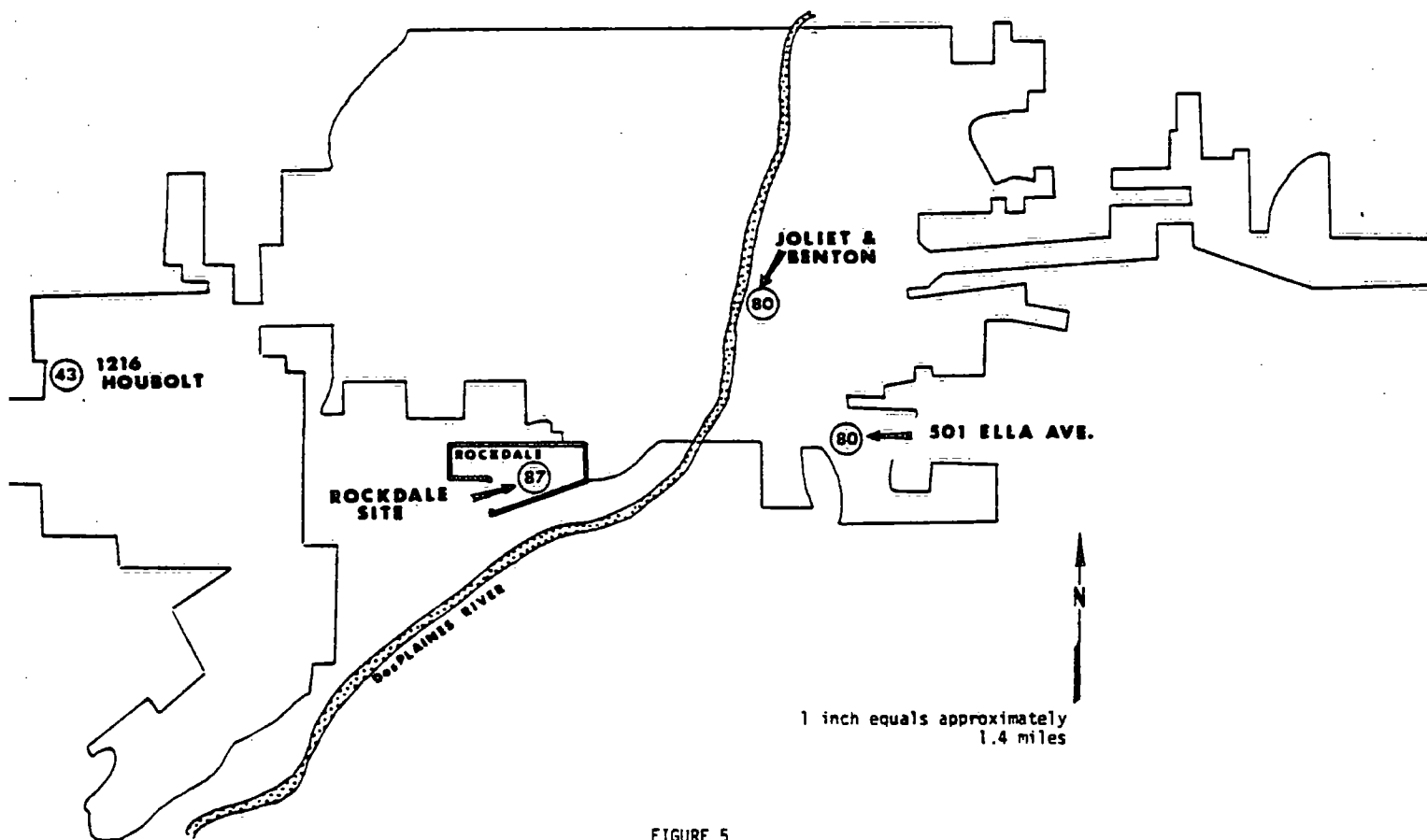
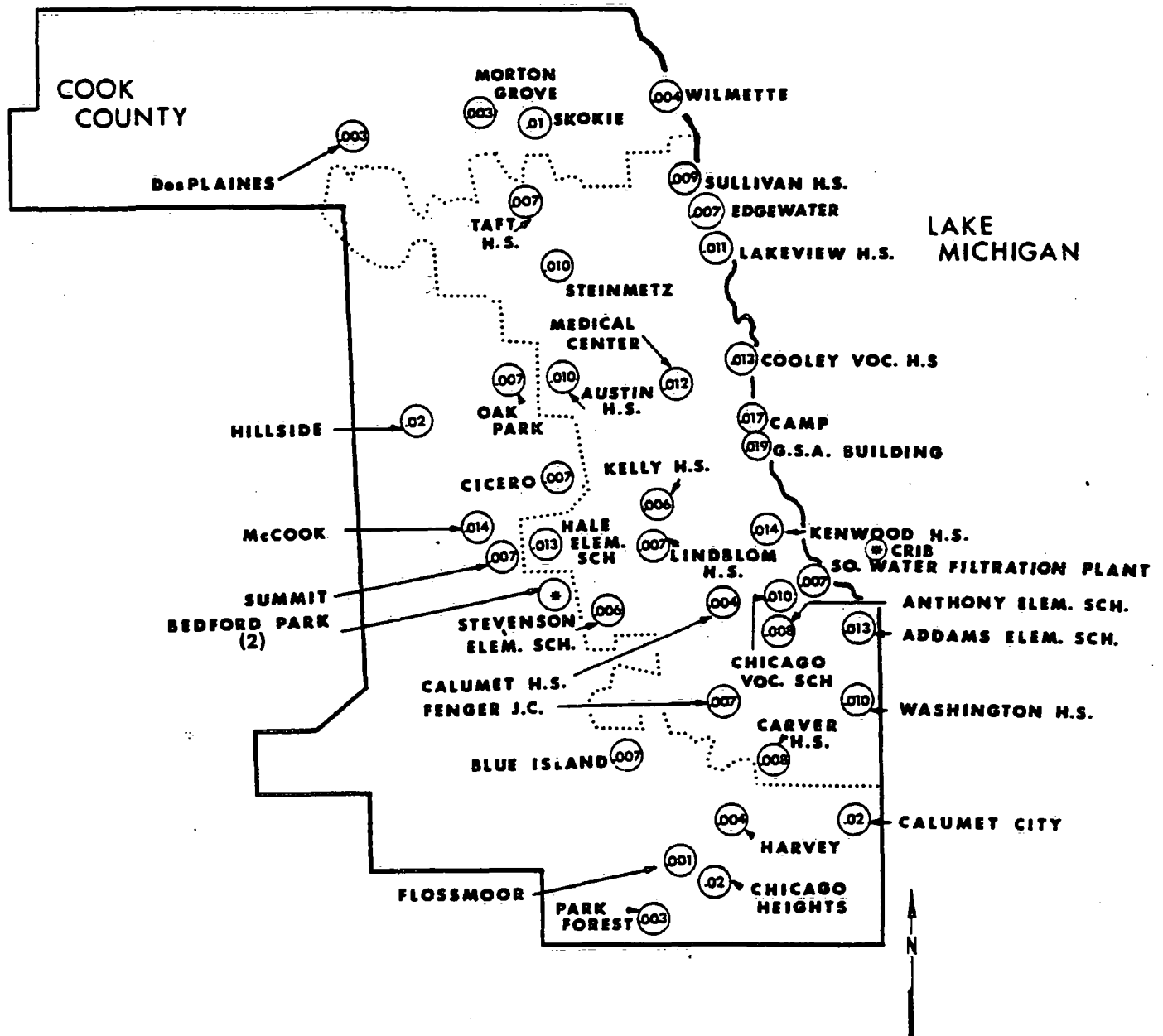


FIGURE 5

COOK COUNTY INCLUDING CHICAGO

**SULFUR DIOXIDE
ANNUAL ARITHMETIC MEAN**
(PARTS PER MILLION)



* Bedford Park - 6535 S. Central - .016
Bedford Park - 6700 S. 78th - .004

CRIB - .009

FIGURE 6

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
COOK COUNTY										
Arlington Heights	33 S. Arlington Heights Rd.	115	2	0	168	152	147	146	62	1.55
Bedford Park	6535 S. Central	60	2	0	254	155	146	127	73	1.50
Bedford Park	6700 S. 78th Avenue	60	0	0	133	126	125	117	64	1.49
Blue Island	12700 Sacramento	115	11	1	282	216	205	196	78	1.55
Blue Island (RASH)	12700 Sacramento	4	0	0	117	70	57	56	*	
Calumet City	755 Pulaski Road	111	7	1	264	200	200	183	66	1.63
Chicago Heights	450 State Street	24	5	0	243	238	216	172	*	
Chicago Heights	Dixie Highway and 10th	108	3	0	191	178	175	147	56	1.65
Cicero	15th St. and 50th Avenue	101	4	0	210	172	160	155	76	1.54
Des Plaines	1755 S. Wolf Road	111	1	0	157	142	141	134	58	1.58
Evanston	1454 Elmwood	52	0	0	113	89	82	73	39	1.45
Flossmoor	999 Kedzie Avenue	107	1	0	174	144	144	138	55	1.57
Franklin Park	3400 N. Rose Street	113	3	0	179	160	156	138	59	1.58
Glenview	1930 Prairie Street	30	1	0	176	125	124	120	*	
Harvey	157th and Lexington	106	9	0	229	221	215	207	67	1.70
Hillside	Wolf Road and Harrison	113	2	0	172	166	138	126	57	1.56
McCook	50th Street and Glencoe	56	15	0	209	187	181	179	110	1.53
McCook	Route 66 and Lawndale	50	10	0	219	217	199	187	101	1.53
Midlothian	15202 Crawford Avenue	116	3	0	158	154	152	142	49	1.58
Morton Grove	9111 Waukegan	111	2	0	169	151	145	125	58	1.62
Niles	8955 Greenwood Avenue	106	1	0	201	141	140	127	56	1.62
Oak Park	Lake and Grove St.	112	0	0	137	122	111	107	53	1.52
Orland Park	133rd and LaGrange	109	1	0	177	142	135	134	52	1.67
Palatine	1000 Quentin Road	114	3	0	162	156	152	138	49	1.64
Park Forest	100 Park Avenue	109	1	0	155	134	127	114	48	1.56
River Forest	Lathrop and Oak Avenue	115	1	0	173	134	130	128	55	1.58
Skokie	4401 Dempster	54	1	0	208	125	109	93	48	1.82
Skokie	7701 Lincoln	56	0	0	140	113	110	106	55	1.57
Summit	60th and 74th Avenue	111	11	0	196	186	172	163	78	1.63
Wilmette	9th Street and Central Ave.	113	0	0	142	124	112	102	43	1.71
Winnetka	112 Willow	58	0	0	111	89	84	81	39	1.65
Chicago:										
Addams Elementary School	10810 S. Avenue "H"	114	33	8	385	351	342	329	118	1.69
Anthony Elementary School	9800 S. Torrence Avenue	109	17	1	313	248	232	230	88	1.65
Austin West High School	118 North Central	114	10	0	238	187	173	170	80	1.70
Calumet High School	8131 South May Street	112	8	1	278	255	213	175	69	1.60
Carver High School	801 East 133rd Place	108	13	2	292	285	235	232	83	1.62
CAMP	445 Plymouth Court	7	2	0	202	174	115	98	*	
Central Office Building	320 North Clark	4	0	0	101	78	74	44	*	
Chicago Vocational H.S.	2100 East 87th Street	105	8	2	282	281	200	177	75	1.69
Cooley Vocational H.S.	1225 North Sedgwick	114	19	1	373	245	235	234	95	1.57
Crib	68th St. and Lake Michigan	67	1	0	152	148	145	136	50	1.99
Edgewater	5358 North Ashland Avenue	101	4	0	218	208	167	157	65	1.62
Farr Dormitory	3300 South Michigan Avenue	29	2	0	245	155	147	140	*	
Fenger Junior College	11220 South Wallace	106	12	2	291	277	245	233	72	1.66
G.S.A. Building	538 South Clark	111	6	0	225	221	183	163	78	1.59
Hale Elementary School	6140 South Melvina Avenue	111	13	3	378	287	280	250	88	1.64
Kelly High School	4136 South California	113	10	1	374	241	233	213	81	1.60
Kenwood High School	5015 Blackstone	110	9	3	309	300	261	215	66	1.76
Lakeview High School	4015 North Ashland	113	7	0	251	204	178	175	66	1.71
Lindblom High School	6130 South Wolcott Avenue	106	6	2	288	261	230	175	77	1.58
Logan Square	2960 West Cortland Avenue	56	1	0	160	142	140	138	73	1.51
Medical Center	1947 West Polk	58	5	0	177	168	164	164	79	1.53
South Water Filtr. Plant	3300 East Cheltenham	92	13	3	405	319	269	260	78	1.90
Steinmetz High School	3030 N. Mobile Avenue	111	1	0	219	139	136	133	62	1.59
Stevenson Elem. School	8010 South Kostner Avenue	104	9	2	429	265	232	170	69	1.74
Sullivan High School	6631 North Bosworth	106	1	0	156	146	127	121	53	1.69
Taft High School	5625 North Natoma	100	11	1	276	220	210	207	70	1.81
Von Steuben High School	5039 North Kimball Avenue	109	3	0	176	159	154	148	59	1.63
Washington High School	3500 East 114th Street	113	67	19	1106	688	617	601	170	1.72

* Did not meet minimum statistical culling criteria (See Section 4.1.).

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG/M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>DUPAGE COUNTY</u>										
Addison	130 West Army Trail Road	56	0	0	112	108	107	100	54	1.43
Bensenville	Main and York	56	10	1	267	213	211	209	88	1.68
Bensenville	375 Meyer	59	2	0	159	154	146	143	63	1.63
Elmhurst	118 Schiller	58	2	0	235	160	147	130	71	1.53
Naperville	175 Jackson Street	57	1	0	165	135	125	123	58	1.52
West Chicago	DuPage County Airport	55	0	0	127	119	118	109	48	1.51
West Chicago	128 W. McConnell	54	2	0	179	167	135	131	56	1.47
Wheaton	201 Reber Street	59	0	0	145	130	111	108	59	1.53
<u>KANE COUNTY</u>										
Elgin	1002 North Liberty	42	0	0	139	118	117	117	56	1.56
<u>KANKAKEE COUNTY</u>										
Bradley	610 East Liberty	51	4	1	281	206	167	166	70	1.72
<u>KENDALL COUNTY</u>										
Plano	Main Street	24	0	0	135	122	114	109	*	
<u>LAKE COUNTY</u>										
Island Lake	Island Lake Grade School	56	1	0	155	101	99	95	47	1.59
Lake Bluff	121 East Sheridan	55	0	0	124	88	86	75	40	1.52
North Chicago (RASN)	1850 Lewis Avenue	36	0	0	145	140	100	91	*	
Waukegan	106 Utica	60	2	0	159	151	149	148	62	1.56
Waukegan	Golf and Jackson	44	0	0	139	127	127	106	46	1.74
Waukegan	2200 Brookside	58	0	0	143	117	110	110	52	1.52
<u>McHENRY COUNTY</u>										
Cary	1st St. and Three Oaks Rd.	51	0	0	126	110	84	82	41	1.55
Crystal Lake	Franklin and Caroline	45	0	0	108	99	98	80	44	1.49
<u>WILL COUNTY</u>										
Crete	North and Elizabeth	39	0	0	108	99	98	80	*	
Joliet	5 East Van Buren	38	1	1	368	137	128	128	*	
Joliet	Midland and Campbell	44	0	0	146	146	139	121	*	
Joliet	1425 North Broadway	30	2	0	163	154	139	120	*	
Joliet	Copperfield and Briggs	29	0	0	142	81	61	59	*	
Joliet	Joliet and Benton	56	6	0	210	200	171	163	80	1.69
Joliet	1216 Houbolt	49	0	0	127	95	87	86	43	1.57
Joliet	501 Ella	38	3	0	165	161	158	135	80	1.51
Lockport	5th and Madison	44	2	0	164	157	150	146	63	1.64
Mokena	10940 Front Street	52	3	0	207	177	162	143	62	1.56
Monroe	432 East Main Street	40	1	0	188	140	134	109	56	1.62
Plainfield	1005 Eastern	44	3	0	165	162	156	135	59	1.62
Rockdale	Well #2 Pump Station	56	3	1	262	158	155	150	87	1.46
Romeoville	Naperville Road	44	2	0	160	155	146	135	58	1.71
Wilmington	South Joliet Street	44	0	0	123	111	110	105	54	1.51

* Did not meet minimum statistical culling criteria (See Section 4.1).

**1977
SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES**

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
COOK COUNTY								
Arlington Heights	33 S. Arlington Heights Rd.	-	-	-	*	72	67	62
Bedford Park	6535 South Central	99	105	93	104	104	78	73
Bedford Park	6700 South 78th Avenue	83	85	88	93	79	69	64
Blue Island	12700 Sacramento	80	66	97	93	92	85	78
Calumet City	755 Pulaski Road	68	56	71	90	77	74	66
Chicago Heights	450 State Street	-	80	71	*	139	*	*
Chicago Heights	Dixie Highway and 10th	61	47	60	72	63	63	56
Cicero	15th Street and 50th Avenue	77	74	88	89	90	75	76
Des Plaines	1755 South Wolf Road	53	44	59	57	61	54	58
Evanston	1454 Elmwood	*	60	51	42	41	38	39
Flossmoor	999 Kedzie Avenue	45	50	60	63	58	66	55
Franklin Park	3400 North Rose Street	63	53	63	69	70	59	59
Glenview	1930 Prairie Street	65	68	61	54	*	*	*
Harvey	157th and Lexington	89	56	78	83	79	75	67
Hillside	Wolf Road and Harrison	58	59	67	74	68	66	57
McCook	50th Street and Glencoe	114	113	125	94	104	101	110
McCook	Route 66 and Lawndale	135	120	107	96	99	91	101
Midlothian	15202 Crawford Avenue	54	42	57	68	62	59	49
Morton Grove	9111 Waukegan	70	51	61	57	*	54	58
Niles	8955 Greenwood Avenue	49	46	66	63	68	56	56
Oak Park	Lake and Grove Street	-	-	-	*	53	-	53
Orland Park	133rd and LaGrange	63	48	58	61	65	69	52
Palatine	1000 Quentin Road	47	33	43	52	51	57	49
Park Forest	100 Park Avenue	50	43	51	57	51	47	48
River Forest	Lanthrop and Oak Avenue	66	54	67	68	67	59	55
Skokie	4401 Dempster	-	-	63	*	39	49	48
Skokie	7701 Lincoln	-	-	-	-	44	58	55
Summit	60th and 74th Avenue	57	62	86	87	89	88	78
Wilmette	9th Street and Central Ave.	44	38	41	54	48	42	43
Winnetka	112 Willow	53	61	36	39	38	42	39
Chicago:								
Addams Elem. School	10810 South Avenue "H"	132	115	122	129	105	131	118
Anthony Elem. School	9800 South Torrence Avenue	102	97	91	95	86	90	88
Austin West High School	118 North Central	-	-	-	-	*	89	80
Calumet High School	8131 South May Street	92	80	82	80	69	73	69
Carver High School	801 East 133rd Place	108	101	92	73	73	91	83
CAMP	445 Plymouth Court	173	155	156	120	121	122	*
Central Office Building	320 Clark	115	97	82	*	*	*	*
Chicago Voc. High School	2100 East 87th Street	99	84	82	91	76	79	75
Cooley Voc. High School	1225 North Sedgwick	132	116	126	112	94	94	95
Crib	68th St. and Lake Michigan	-	-	62	52	*	*	50
Edgewater	5358 North Ashland	-	-	-	-	-	69	65
Farr Dormitory	3300 South Michigan Avenue	109	87	79	85	*	*	*
Fenger Junior College	11220 South Wallace	93	79	79	85	80	80	72
G.S.A. Building	538 South Clark	116	101	108	103	95	80	78
Hale Elementary School	6140 South Melvina	100	87	92	80	68	88	88
Kelly High School	4136 South California	96	96	88	90	85	83	81
Kenwood High School	5015 Blackstone	91	80	76	70	65	71	66
Lakeview High School	4015 North Ashland	93	80	83	75	70	72	66
Lindblom High School	6130 South Wolcott Avenue	83	89	80	*	63	75	77
Logan Square	2960 West Cortland Avenue	104	85	78	81	72	66	73
Medical Center	1947 West Polk	122	103	127	86	90	72	79
So. Water Filtr. Plant	3300 E. Cheltenham	95	67	68	68	67	67	78
Steinmetz High School	3030 North Mobile Avenue	72	67	72	65	67	64	62
Stevenson Elem. School	8010 South Kostner Avenue	87	83	79	69	75	77	69
Sullivan High School	6631 North Bosworth	84	71	65	63	57	58	53
Taft High School	5625 North Natoma	76	70	76	76	60	64	70
Von Steuben High School	5039 North Kimball Avenue	85	48	64	64	70	*	59
Washington High School	3500 East 114th Street	168	134	163	153	148	175	170

- Site no in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

1977
SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>DUPAGE COUNTY</u>								
Addison	130 West Army Trail Road	72	91	81	66	68	53	54
Bensenville	Main and York	160	114	110	100	93	109	88
Bensenville	375 Meyer	-	-	-	*	55	57	63
Elmhurst	118 Schiller	94	95	69	73	69	69	71
Naperville	175 Jackson Street	-	*	65	69	68	58	58
West Chicago	DuPage County Airport	-	*	51	51	68	51	48
West Chicago	128 West McConnell	-	-	60	58	70	59	56
Wheaton	201 Reber Street	75	76	51	40	*	58	59
<u>KANE COUNTY</u>								
Elgin	1002 North Liberty	89	92	56	57	60	59	56
<u>KANKAKEE COUNTY</u>								
Bradley	610 East Liberty	-	-	-	-	*	*	70
<u>KENDALL COUNTY</u>								
Plano	Main Street	-	-	-	-	*	62	*
<u>LAKE COUNTY</u>								
Island Lake	Island Lake Grade School	89	53	58	41	47	46	47
Lake Bluff	121 East Sheridan	50	55	43	39	42	43	40
North Chicago	1850 Lewis Avenue	68	68	63	*	51	54	*
Waukegan	106 Utica	86	83	69	58	65	58	62
Waukegan	Golf and Jackson	-	-	-	-	-	*	46
Waukegan	2200 Brookside	-	-	-	-	-	*	52
<u>McHENRY COUNTY</u>								
Cary	1st St. and Three Oaks Rd.	*	64	*	60	*	*	41
Crystal Lake	Franklin and Caroline	44	53	*	*	46	49	44
<u>WILL COUNTY</u>								
Crete	North and Elizabeth	96	84	56	65	60	72	*
Joliet	5 East Van Buren	*	105	81	*	77	91	*
Joliet	Midland and Campbell	87	97	68	87	71	72	*
Joliet	1425 North Broadway	98	97	78	86	78	*	*
Joliet	Copperfield and Briggs	97	84	66	72	72	71	*
Joliet	Joliet and Benton	114	95	83	78	94	83	80
Joliet	1216 Houbolt	-	-	61	59	53	75	43
Joliet	501 Ella	-	-	63	85	79	82	80
Lockport	5th and Madison	87	79	62	74	70	68	63
Mokena	10940 Front Street	87	72	61	73	61	73	62
Monroe	432 East Main Street	61	49	41	63	48	64	56
Plainfield	1005 Eastern	-	-	-	*	*	86	59
Rockdale	Well #2 Pump Station	112	104	80	112	97	104	87
Romeoville	Naperville Road	78	48	36	77	65	80	58
Wilmington	South Joliet Street	-	-	-	-	-	*	54

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

1977
SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR	24-HR	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS	AVGS	1st	2nd	1st	2nd		
COOK COUNTY											
Bedford Park	6535 South Central	6647		0	0	.321	.110	.086	.046	.016	1.90
Bedford Park	6700 South 78th		58	NA	0	NA	NA	.017	.015	.005	2.05
Blue Island	12700 Sacramento		57	NA	0	NA	NA	.017	.016	.004	1.78
Blue Island (RASN)	12700 Sacramento		116	NA	1	NA	NA	.158	.085	.007	3.65
Calumet City	755 Pulaski	7181	6	NA	0	NA	NA	.049	.029	*	
Chicago Heights	Dixie Highway and 10th	7504		0	1	.21	.16	.15	.12	.02	2.61
			113	NA	0	NA	NA	.027	.016	.003	2.32
				0	0	.16	.12	.06	.06	.02	2.31
Cicero	15th Street and 50th Avenue		113	NA	0	NA	NA	.030	.027	.003	2.64
Des Plaines	1755 South Wolf Road		117	NA	0	NA	NA	.063	.048	.007	3.62
Flossmoor	999 Kedzie		112	NA	0	NA	NA	.028	.027	.003	2.38
Harvey	157th and Lexington		117	NA	0	NA	NA	.031	.025	.004	2.79
Hillside	Wolf Road and Harrison	7600	108	NA	0	NA	NA	.038	.034	.004	2.87
				0	0	.17	.15	.08	.07	.02	2.31
McCook	50th Street and Glencoe	7591	116	NA	0	NA	NA	.035	.033	.002	2.02
Morton Grove	9111 Waukegan			0	0	.138	.117	.058	.058	.014	2.20
Oak Park	834 Lake Street		115	NA	0	NA	NA	.027	.021	.003	2.53
Park Forest	120 Park Avenue		114	NA	0	NA	NA	.043	.039	.007	3.49
Skokie	9800 Lawler	7216	113	NA	0	NA	NA	.042	.025	.003	2.57
				0	0	.08	.08	.05	.04	.01	2.03
Summit	60th and 74th Avenue		114	NA	0	NA	NA	.042	.023	.003	2.26
Wilmette	9th Street and Central Ave.		111	NA	0	NA	NA	.034	.027	.007	3.30
			115	NA	0	NA	NA	.059	.040	.004	2.70
Chicago:											
Addams Elementary School	10810 South Avenue "H"		58	NA	0	NA	NA	.051	.044	.013	3.58
Anthony Elementary School	9800 South Torrence		53	NA	0	NA	NA	.069	.040	.008	3.23
Austin West High School	118 North Central	1377		0	0	.06	.05	.02	.02	*	
			60	NA	0	NA	NA	.063	.044	.010	3.14
Calumet High School	8131 South May		61	NA	0	NA	NA	.023	.013	.004	2.64
Carver High School	801 East 133rd Place		58	NA	0	NA	NA	.052	.039	.008	3.19
CAMP	445 Plymouth	7365		0	1	.207	.173	.142	.116	.017	-
			7	NA	0	NA	NA	.041	.030	*	
Cermak Pump Station	735 West Harrison	3204		0	0	.10	.10	.08	.06	*	
Central Office Building	320 North Clark		0	-	-	-	-	-	-	*	
Chicago Vocational H.S.	2100 East 87th Street		60	NA	0	NA	NA	.053	.051	.010	3.13
Cooley Vocational H.S.	1225 North Sedgwick		61	NA	0	NA	NA	.083	.080	.013	4.24
Crib	68th St. and Lake Michigan		36	NA	0	NA	NA	.073	.024	.009	2.86
Edgewater	5358 North Ashland	1859		0	0	.07	.07	.04	.04	*	
			56	NA	0	NA	NA	.049	.024	.007	3.09
Fenger Junior College	11220 South Wallace	2102		0	0	.07	.06	.03	.03	*	
			60	NA	0	NA	NA	.041	.037	.007	3.24
G.S.A. Building	538 South Clark		56	NA	0	NA	NA	.115	.092	.019	4.22
Hale Elementary School	6140 South Melvina		61	NA	0	NA	NA	.082	.043	.013	2.96
Kelly High School	4136 South California		60	NA	0	NA	NA	.031	.029	.006	2.91
Kenwood High School	5015 Blackstone	2077		0	0	.04	.04	.03	.03	*	
			61	NA	0	NA	NA	.066	.064	.014	2.61
Lakeview High School	4015 N. Ashland		61	NA	0	NA	NA	.078	.067	.011	3.25
Lindblom High School	6130 S. Wolcott	3777		0	0	.05	.05	.04	.04	*	
			60	NA	0	NA	NA	.043	.038	.007	3.26
Medical Center	1947 West Polk	7883		0	0	.214	.149	.076	.073	.012	2.13
South Water Filtr. Plant	3300 E. Cheltenham		56	NA	0	NA	NA	.022	.017	.005	2.63
State Office Building	160 North LaSalle	5854		0	0	.205	.200	.122	.120	*	
Steinmetz High School	3030 North Mobile		59	NA	0	NA	NA	.049	.039	.010	3.14
Stevenson Ele. School	8010 South Kostner	2015		0	0	.05	.05	.02	.02	*	
			57	NA	0	NA	NA	.032	.020	.006	2.94
Sullivan High School	6631 North Bosworth		60	NA	0	NA	NA	.051	.047	.009	3.25
Taft High School	5625 North Natoma	1813		0	0	.05	.05	.04	.04	*	
			56	NA	0	NA	NA	.049	.037	.007	3.27
Washington High School	3500 E. 114th Street		60	NA	0	NA	NA	.056	.037	.010	3.40
DuPAGE COUNTY											
Bensenville	375 Meyer		44	NA	0	NA	NA	.037	.024	.007	2.48

NA - Not applicable

* - Did not meet minimum statistical culling criteria (see section 4.1).

**1977
SULFUR DIOXIDE
(PARTS PER MILLION)**

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3 - HR AVGS > 5	24 HR AVGS > 14	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
						1st	2nd	1st	2nd		
<u>LAKE COUNTY</u>											
Waukegan	Golf and Jackson	6641		0	0	.100	.095	.087	.081	.012	2.07
Waukegan	3010 Grand Avenue		45	NA	0	NA	NA	.042	.020	.006	2.35
<u>WILL COUNTY</u>											
Joliet	Midland & Campbell		32	NA	0	NA	NA	.023	.018	*	
Joliet	Joliet and Benton	8062		0	0	.172	.082	.045	.038	.008	1.74
Lockport	5th and Madison		30	NA	0	NA	NA	.016	.011	*	
Rockdale	Well #2 Pump Station		32	NA	0	NA	NA	.025	.021	*	
Romeoville	Naperville Road		13	NA	0	NA	NA	.024	.013	*	

NA Not applicable

* Did not meet minimum statistical culling criteria (see section 4.1).

**1977
SHORT-TERM TRENDS FOR
SULFUR DIOXIDE**

STATION	ADDRESS	ANNUAL MEAN (UG M ³)						
		1971	1972	1973	1974	1975	1976	1977
COOK COUNTY								
Bedford Park	6535 South Central	.028	.017	.016	.021	.007	.018	.016
Bedford Park	6700 South 78th	.026	.022	.016	*	.006	.005	.004
Blue Island	12700 Sacramento	-	.004	.006	.016	.029	.019	.007
Calumet City	755 Pulaski	.013	.009	.009	.012	.010	.02	.02
Chicago Heights	Dixie Highway and 10th	.013	.012	.011	.012	.009	.02	.02
Cicero	15th St. and 50th Avenue	.013	.012	.012	.010	.010	.007	.007
Des Plaines	1755 South Wolf Road	-	-	.001	.002	.004	.003	.003
Flossmoor	999 Kedzie	-	-	-	-	*	.008	.004
Harvey	157th and Lexington	.015	.007	.008	.009	.011	.005	.004
Hillside	Wolf Road and Harrison	.009	.008	.004	.006	.006	.003	.02
McCook	50th and Glencoe	.037	.035	.035	*	*	.015	.014
Morton Grove	3111 Waukegan	.023	.006	.004	.004	*	.004	.003
Oak Park	834 Lake Street	-	-	-	-	-	-	.007
Park Forest	100 Park Avenue	.004	.004	.005	.004	.004	.002	.003
Skokie	9800 Lawler	-	-	-	-	*	.02	.01
Summit	60th and 74th Avenue	.007	.007	.004	.015	.010	.007	.007
Wilmette	9th St. and Central Avenue	.020	.005	.002	.003	.005	.003	.004
Chicago:								
Addams Elem. School	10810 South Avenue "H"	-	.020	.026	.021	.016	.015	.013
Anthony Elem. School	9800 South Torrence	-	.015	.011	.003	.007	.009	.008
Austin West High School	118 North Central	-	-	-	-	*	.006	.010
Calumet High School	8131 South May	.015	.023	.016	.013	.009	.007	.004
Carver High School	801 East 133rd Place	.024	.022	.016	.013	.008	.010	.008
CAMP	445 Plymouth	-	-	*	.019	.019	.020	.017
Cermack Pump Station	735 West Harrison	-	-	-	-	-	-	*
Central Office Building	320 North Clark	-	-	-	.016	*	.010	*
Chicago Vocational H.S.	2100 East 87th Street	.007	.014	.014	.012	.009	.008	.010
Cooley Vocational H.S.	1225 North Sedgwick	.030	.025	.022	.021	.016	.011	.013
Crib	68th and Lake Michigan	-	-	-	-	-	-	.009
Edgewater	5358 North Ashland	-	-	-	-	-	-	.007
Fenger Jr. College	11220 South Wallace	.017	.022	.016	.014	.011	.009	.007
G.S.A. Building	538 South Clark	.027	.036	.030	.023	.019	.013	.019
Hale Elem. School	6140 South Melvina	.017	.027	.021	.014	.011	.012	.013
Kelly High School	4136 South California	.024	.020	.014	.011	.011	.007	.006
Kenwood	5015 Blackstone	-	.025	.019	.014	.011	.007	.014
Lakeview High School	4015 North Ashland	.029	.027	.019	.010	.013	.009	.011
Lindblom High School	6130 South Wolcott	.016	.018	.011	.013	.008	.007	.007
Medical Center	1947 West Polk	-	-	*	.031	.017	.015	.012
South Water Filtr. Plant	3300 East Cheltenham	-	.016	.015	.008	.006	.008	.005
Steinmetz High School	3030 North Mcbile	.018	.014	.009	.007	.007	.006	.010
Stevenson High School	8010 South Kostner	.012	.014	.019	.014	.011	.009	.006
Sullivan High School	6631 North Bosworth	.019	.022	.016	.010	.006	.007	.009
Taft High School	5625 North Natoma	.016	.017	.012	.010	.007	.006	.007
Washington High School	3500 East 114th Street	-	-	.021	.022	.013	.011	.010

* Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

**1977
NITROGEN DIOXIDE
(PARTS PER MILLION)**

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
COOK COUNTY									
Blue Island	12700 Sacramento		114	.030	.039	.052	.033	.039	1.47
Blue Island (RASH)	12700 Sacramento		6	.020	*	*	*	*	
Calumet City	755 Pulaski		112	.023	.034	.049	.029	.034	1.59
Chicago Heights	Dixie Highway and 10th St.		114	.025	.034	.044	.035	.035	1.53
Cicero	15th Street and 50th Ave.		117	.036	.044	.060	.042	.046	1.46
Des Plaines	1755 South Wolf Road		113	.033	.040	.052	.035	.040	1.56
Flossmoor	999 Kedzie		116	.026	.035	.045	.033	.035	1.54
Harvey	157th and Lexington		107	.031	.043	.054	.037	.041	1.47
Hillside	Wolf Road and Harrison		114	.033	.040	.054	.036	.041	1.46
Morton Grove	9111 Waukegan		115	.036	.042	.058	.041	.044	1.47
Oak Park	834 Lake Street		113	.037	.044	.056	.040	.045	1.49
Park Forest	100 Park Avenue		115	.025	.034	.042	.031	.033	1.55
Skokie	9800 Lawler		114	.037	.044	.067	.041	.047	1.55
Summit	60th and 74th Avenue		104	.034	.044	.051	.039	.043	1.42
Wilmette	9th Street and Central Ave.		116	.030	.030	.050	.036	.036	1.60
Chicago:									
Addams Elementary School	10810 South Avenue "H"		58	.037	.033	.047	.038	.038	1.51
Anthony Elem. School	9800 South Torrence		53	.039	.035	.039	.038	.038	1.39
Austin West High School	118 North Central		60	.041	.044	.056	.047	.047	1.32
Calumet High School	8131 South May		61	.033	.037	.040	.035	.037	1.47
Carver High School	801 East 133rd Place		58	.032	.035	.038	.038	.036	1.41
CAMP	445 Plymouth	8322		.040	.062	-	-	.048	--
Central Office Building	320 North Clark		55	.052	.062	.060	.054	.057	1.36
Chicago Vocational H.S.	2100 East 87th Street		3	*	*	*	*	*	
Cooley Vocational H.S.	1225 North Sedgwick		60	.036	.035	.043	.038	.038	1.36
Crib	68th St. and Lake Michigan		61	.041	.044	.047	.045	.044	1.42
Edgewater	5358 North Ashland		36	.036	.027	.028	.040	.032	1.56
Fenger Junior College	11220 South Wallace		56	.034	.044	.045	.040	.041	1.40
G.S.A. Building	538 South Clark		60	.034	.029	.025	.027	.028	1.35
Hale Elementary School	6140 South Melvina		56	.048	.049	.055	.048	.050	1.28
Kelly High School	4136 South California		61	.035	.041	.041	.036	.038	1.32
Kenwood High School	5015 Blackstone		60	.037	.044	.046	.039	.042	1.33
Lakeview High School	4015 North Ashland		61	.039	.034	.042	.039	.039	1.44
Lindblom High School	4015 North Ashland		61	.038	.045	.047	.043	.043	1.45
Medical Center	6130 South Wolcott		60	.038	.041	.044	.039	.040	1.32
South Water Filtr. Plant	1947 West Polk	8075		.025	.055	.048	.028	.040	2.29
State Office Building	3300 East Cheltenham		57	.026	.028	.031	.030	.029	1.63
Steinmetz High School	160 North LaSalle	3306		*	.071	*	*	*	
Stevenson Elem. School	3030 North Mobile		59	.036	.039	.044	.039	.039	1.33
Sullivan High School	8010 South Kostner		57	.026	.035	.034	.033	.032	1.40
Taft High School	6631 North Bosworth		60	.037	.031	.036	.033	.034	1.60
Washington High School	5625 North Natoma		56	.035	.038	.041	.035	.037	1.58
	3500 East 114th Street		60	.036	.032	.039	.037	.036	1.37
DuPAGE COUNTY									
Bensenville	375 Meyer		49	.029	.025	.025	.026	.026	1.60
LAKE COUNTY									
Waukegan	3010 Grand Avenue		45	.030	.027	.023	.024	.026	1.47
WILL COUNTY									
Joliet	Midland and Campbell		27	*	.019	.019	*	*	
Joliet	Joliet and Benton	7551		.032	.035	.036	.029	.033	1.85
Lockport	5th and Madison		29	*	.017	.017	*	*	
Rockdale	Well #2 Pump Station		31	*	.023	.025	*	*	
Romeoville	Naperville Road		10	*	.019	*	*	*	

* - Did not meet minimum statistical culling criteria (See Section 4.1)

**1977
OZONE**
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)										ANNUAL	
		TOTAL	> .08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT				
												1st	2nd		
<u>COOK COUNTY</u>															
Arlington Heights ¹	33 S. Arlington Hts.	4253	94	NS	.143 (11)	.167 (36)	.113 (24)	.135 (19)	.081 (1)	.089 (3)	.039	.167	.159		
Bedford Park	6535 South Central	6433	38	.040	.140 (8)	.120 (18)	.100 (4)	.090 (5)	.070 (3)	NS	.140	.140			
Calumet City	755 Pulaski Road	7679	273	.055	.105 (13)	.151 (129)	.121 (38)	.144 (81)	.092 (9)	.087 (3)	.057	.151	.148		
Chicago Heights	Dixie Hwy. & 10th St.	7663	93	.062	.086 (6)	.138 (32)	.104 (20)	.090 (10)	.129 (25)	.061	.050	.138	.129		
Evanston ¹	531 Lincoln	2536	1	NS	NS	NS	NS	NS	NS	.087 (1)	.062	.087	.079		
Hillside	Wolf and Harrison	8037	230	.069	.107 (7)	.138 (61)	.122 (43)	.141 (82)	.105 (5)	.084 (2)	.047	.141	.138		
Skokie	9800 Lawler Street	8335	138	.062	.167 (23)	.141 (34)	.176 (28)	.185 (46)	.192 (7)	.056	.044	.192	.185		
Chicago:															
Austin West H.S.	118 North Central	4854	9	.034	.037	.093 (8)	.088 (1)	.063	.034	.037	.017	.093	.088		
CAMP	445 Plymouth	7337	3	.030	.040	NS	.080	.130 (2)	.085 (1)	.050	.025	.130	.090		
Cermak Pump Station	735 West Harrison	5026	2	.023	.018	.042	.012	.107 (2)	.060	.023	.023	.107	.105		
Edgewater	5358 North Ashland	3387	29	.057	.141 (4)	.167 (22)	.105 (3)	.044	.053	NS	NS	.167	.141		
Kenwood High School	5015 Blackstone	6334	261	.051	.063	.207 (119)	.142 (45)	.241 (83)	.190 (13)	.081 (1)	.047	.241	.207		
Lindblom H.S.	6130 South Wolcott	6329	18	.029	.061	.136 (8)	.087 (1)	.122 (7)	.091 (2)	.051	.030	.136	.122		
Medical Center	1947 West Polk	7761	94	.053	.132 (10)	.155 (40)	.114 (19)	.147 (21)	.097 (4)	.058	.032	.155	.147		
Stevenson Ele. Sch.	8010 South Kostner	4285	11	.057	.134 (10)	.081 (1)	.077	.076	.060	.055	NS	.134	.126		
State Office Bldg.	160 North LaSalle	4353	9	NS	NS	NS	.022	.128 (6)	.121 (3)	.044	.023	.128	.128		
Taft High School	5225 N. Natoma	0	-	-	-	-	-	-	-	-	-	-	-		
<u>DuPAGE COUNTY</u>															
Wheaton ¹	111 N. County Farm Rd	4972	120	.052	.130 (24)	.155 (52)	.118 (32)	.094 (12)	.058	.053	.034	.155	.136		
<u>KANKAKEE COUNTY</u>															
Kankakee ¹	109 Indiana	3966	196	NS	NS	.154 (92)	.145 (42)	.118 (57)	.072	.142 (5)	.047	.154	.152		
<u>LAKE COUNTY</u>															
Libertyville ¹	1441 Lake Street	731	0	NS	NS	NS	NS	NS	NS	.053	.056	.056	.056		
Waukegan ¹	Golf and Jackson	5657	169	NS	.074	.266 (92)	.170 (42)	.186 (29)	.194 (5)	.081 (1)	.044	.265	.261		
<u>WILL COUNTY</u>															
Joliet	Joliet and Benton	7851	124	.060	.090 (6)	.160 (55)	.110 (23)	.143 (28)	.103 (6)	.104 (6)	.044	.160	.155		

NS - No samples

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

¹Special Purpose Site

**1977
CARBON MONOXIDE**
(PARTS PER MILLION)

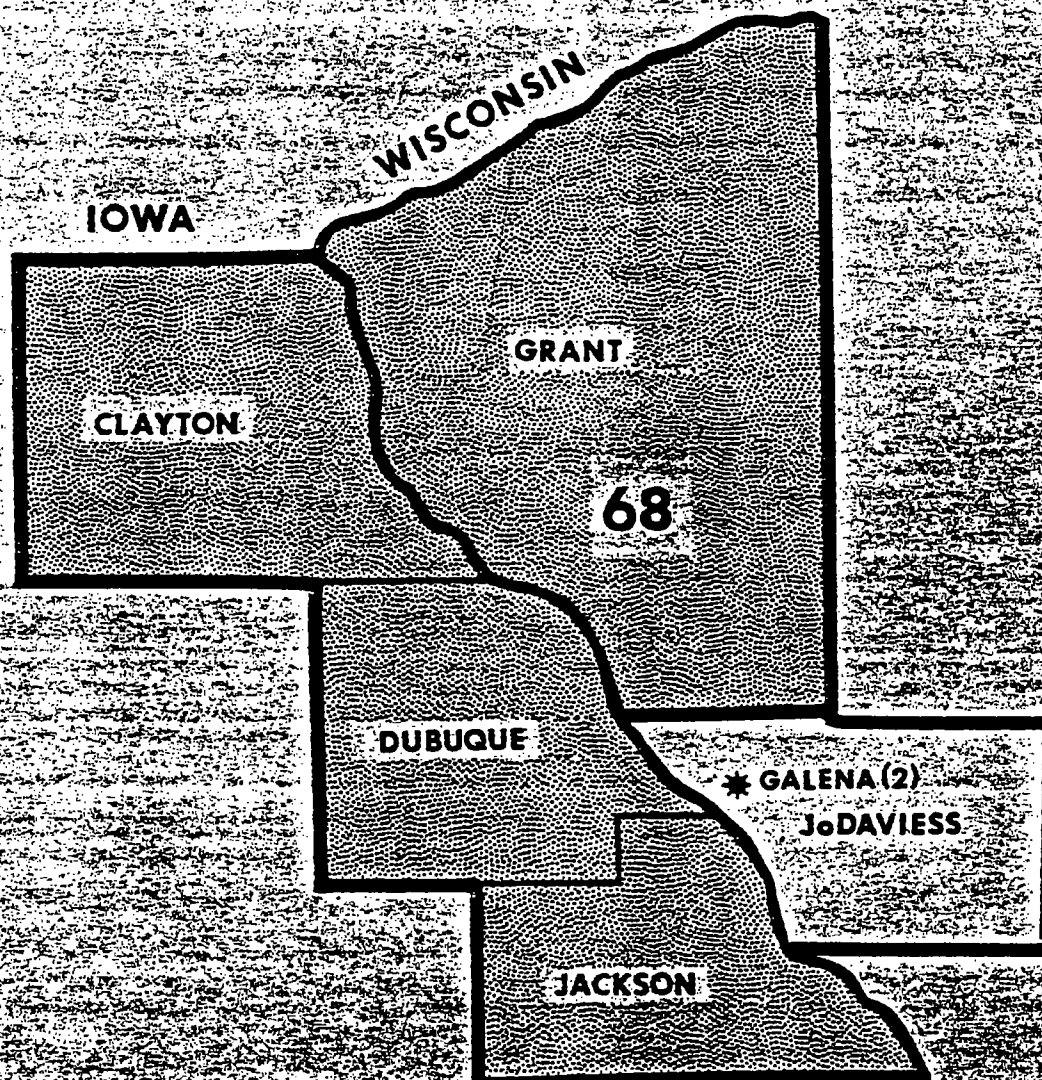
STATION	ADDRESS	NO OF SAMPLES	NUMBER OF AVERAGES		HIGHEST					
			1 - HR > 35 PPM	8 - HR > 9 PPM	1-HR AVERAGE			8-HR AVERAGE		
					1st	2nd	3rd	1st	2nd	3rd
<u>COOK COUNTY</u>										
Calumet City	755 Pulaski Road	7748	0	0	7.1	7.0	6.7	6.7	6.4	6.2
Chicago Heights	Dixie Hwy. & 10th St.	7940	0	0	9.1	4.6	4.4	4.2	4.1	4.1
Hillside	Wolf Rd. & Harrison	8017	0	0	4.9	4.8	4.4	4.1	3.3	3.3
Skokie	9800 Lawler	7796	0	0	10.3	8.9	8.8	6.8	6.8	6.7
Chicago:										
Austin W. H.S.	118 North Central	0	-	-	-	-	-	-	-	-
CAMP	445 Plymouth	8256	0	30	22	21	20	13	13	13
Cermak Pump Station	735 West Harrison	3381	0	0	14.3	13.1	12.9	8.8	8.5	8.2
Daley Center	121 North LaSalle	6319	0	1	15	14	14	10	9	9
Edgewater	5358 Ashland	0	-	-	-	-	-	-	-	-
Medical Center	1947 West Polk	7543	0	0	22.3	12.5	12.0	7.9	6.5	6.2
State Office Bldg.	160 North LaSalle	6319	0	74	22.1	21.9	20.3	16.0	14.6	14.5
Stevenson El. Sch.	8010 South Kostner	2502	0	0	11.7	11.4	11.3	7.3	6.0	5.8
Sunnyside and Knox	4632 West Sunnyside	2799	0	15	15.0	14.6	13.5	12.8	10.9	10.5
<u>WILL COUNTY</u>										
Joliet	Joliet and Benton	8231	0	0	10.0	8.6	7.6	5.2	4.4	4.3

NON - METHANE HYDROCARBONS
(PARTS PER MILLION)

STATION	ADDRESS	NO OF AVERAGES		HIGHEST AVERAGES (PPM) (6 - 9 am)											
		TOTAL 6-9am	>.24 6-9am	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
<u>COOK COUNTY</u>															
Chicago	1947 West Polk	323	274	2.4	1.4	1.7	1.5	1.8	1.6	3.9	2.7	2.4	2.2	2.6	2.5
<u>WILL COUNTY</u>															
Joliet	Joliet and Benton	216	211	2.5	1.2	2.2	1.5	1.8	2.3	NS	NS	NS	NS	2.5	2.4

NS - No Sample

**AIR QUALITY CONTROL REGION 68
METROPOLITAN DUBUQUE INTERSTATE
(IOWA-ILLINOIS-WISCONSIN)**



Data for the Iowa-Wisconsin portion of this control region can be obtained from:

Iowa Department of
Environmental Quality,
3920 Delaware Avenue,
P.O. Box 3326,
Des Moines, Iowa 50316
(515) 281-8692

Wisconsin Department of
Natural Resources,
Bureau of Air Management,
Box 7921,
Madison, Wisconsin 53707
(608) 266-0603

(The number of sampling sites in each city is shown in parenthesis following the city name.)

METROPOLITAN DUBUQUE INTERSTATE (IOWA-ILLINOIS-WISCONSIN)
AIR QUALITY CONTROL REGION (AQCR) 68

TOTAL SUSPENDED PARTICULATES

The only site in the Illinois portion of AQCR 68, Galena, recorded an annual geometric mean of 68 ug/m^3 ; less than the primary annual standard and similar to the geometric means recorded in 1975 and 1976. One 24-hour sample was found to be in excess of the 24-hour primary standard, but since only one was measured, no violation resulted. The concentration of the highest sample was 376 ug/m^3 .

SULFUR DIOXIDE

The annual arithmetic mean in Galena was .004 ppm which is well below the primary annual standard of .03 ppm. The maximum 24-hour sample was .019 ppm.

NITROGEN DIOXIDE

The site in Galena did not have a sufficient number and distribution of samples for a valid annual average.

OZONE, CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG/M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>JO DAVIESS COUNTY</u> Galena	311 S. Main St.	48	5	1	376	237	180	153	68	1.81

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>JO DAVIESS COUNTY</u> Galena	311 S. Main St.	-	-	-	-	70	70	68

SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR. AVG.	24-HR. AVG.	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				>.5	>.14	1st	2nd	1st	2nd		
<u>Jo Daviess County</u> Galena	311 S. Main St.		47	NA	0	NA	NA	.019	.018	.004	2.05

- Site not in operation during year shown.

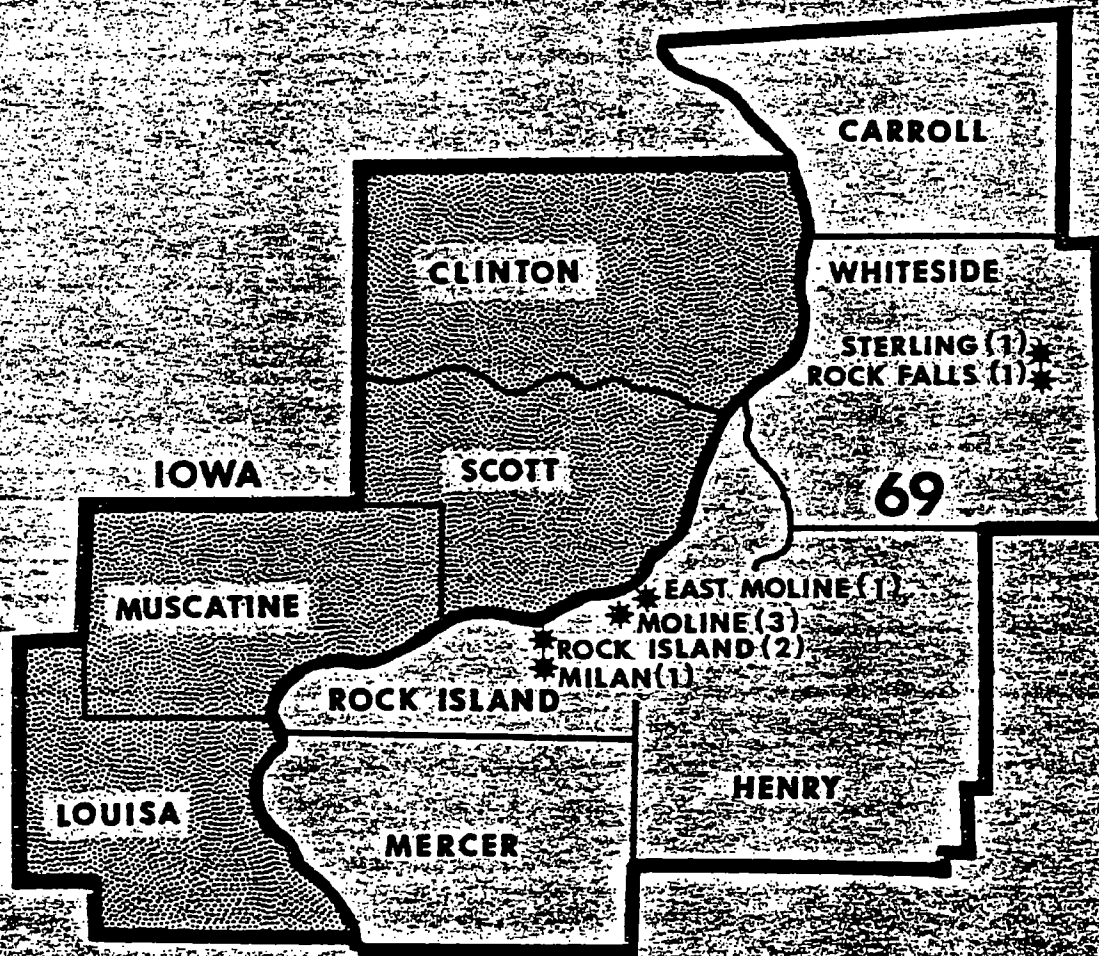
NA - Not applicable

1977
NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>JO DAYLESS COUNTY</u> Galena	311 S. Main St.		42	.013	.009	.011	*	*	

* - Did not meet minimum statistical culling criteria (See Section 4.1)

AIR QUALITY CONTROL REGION 69 METROPOLITAN QUAD CITIES INTERSTATE (ILLINOIS-IOWA)



Data for the Iowa portion of this control region can be obtained from:
Iowa Department of Environmental Quality,
3920 Delaware Avenue,
P. O. Box 3326,
Des Moines, Iowa 50316
(515) 281-8692

(The number of sampling sites in each city is shown in parenthesis following the city name.)

METROPOLITAN QUAD CITIES INTERSTATE (IOWA-ILLINOIS)
AIR QUALITY CONTROL REGION (AQCR) 69

TOTAL SUSPENDED PARTICULATES

A total of seven sites recorded valid annual geometric means for 1977. Of these seven, two were in excess of the primary annual standard of 75 ug/m^3 . The site at 619 16th Avenue in Moline had a large decrease in the annual mean from 1976 to 1977. The value measured in 1976 was 81 ug/m^3 while 64 ug/m^3 was found in 1977. Figure 7 is a map of the Quad Cities area which shows the annual geometric means by site.

Two sites, Milan and 619 16th Avenue - Moline, recorded single excursions (no violations) of the 24-hour primary standard. The highest 24-hour averages were 330 ug/m^3 in Moline and 300 ug/m^3 in Milan.

SULFUR DIOXIDE

Only one site, East Moline, recorded a valid annual average with a value of .004 ppm, well below the primary annual standard of .03 ppm. Rock Island recorded the highest 24-hour average of .029 ppm.

NITROGEN DIOXIDE

The only site monitoring for NO_2 in the Illinois portion of this AQCR, East Moline, recorded an annual average of .027 ppm. This is compared with the annual primary standard of .05 ppm.

OZONE

The monitoring site in Rock Island recorded 56 excursions of the 1-hour primary standard in 1977 compared with only 1 in 1976. The month of May accounted for 75 percent of the total number of excursions. The highest 1-hour average was .167 ppm while only .087 ppm was detected in 1976.

CARBON MONOXIDE

The monitoring site in Rock Island did not record excursions of either the 8-hour standard of 9 ppm or the 1-hour standard of 35 ppm. However, the highest 8-hour average of 8.9 ppm was bordering the 8-hour standard. The highest 1-hour sample was 12.2 ppm.

NON-METHANE HYDROCARBONS

Data not available in Illinois portion of this air quality control region.

QUAD-CITY AREA
TOTAL SUSPENDED PARTICULATES
ANNUAL GEOMETRIC MEAN
(MICROGRAMS PER CUBIC METER)

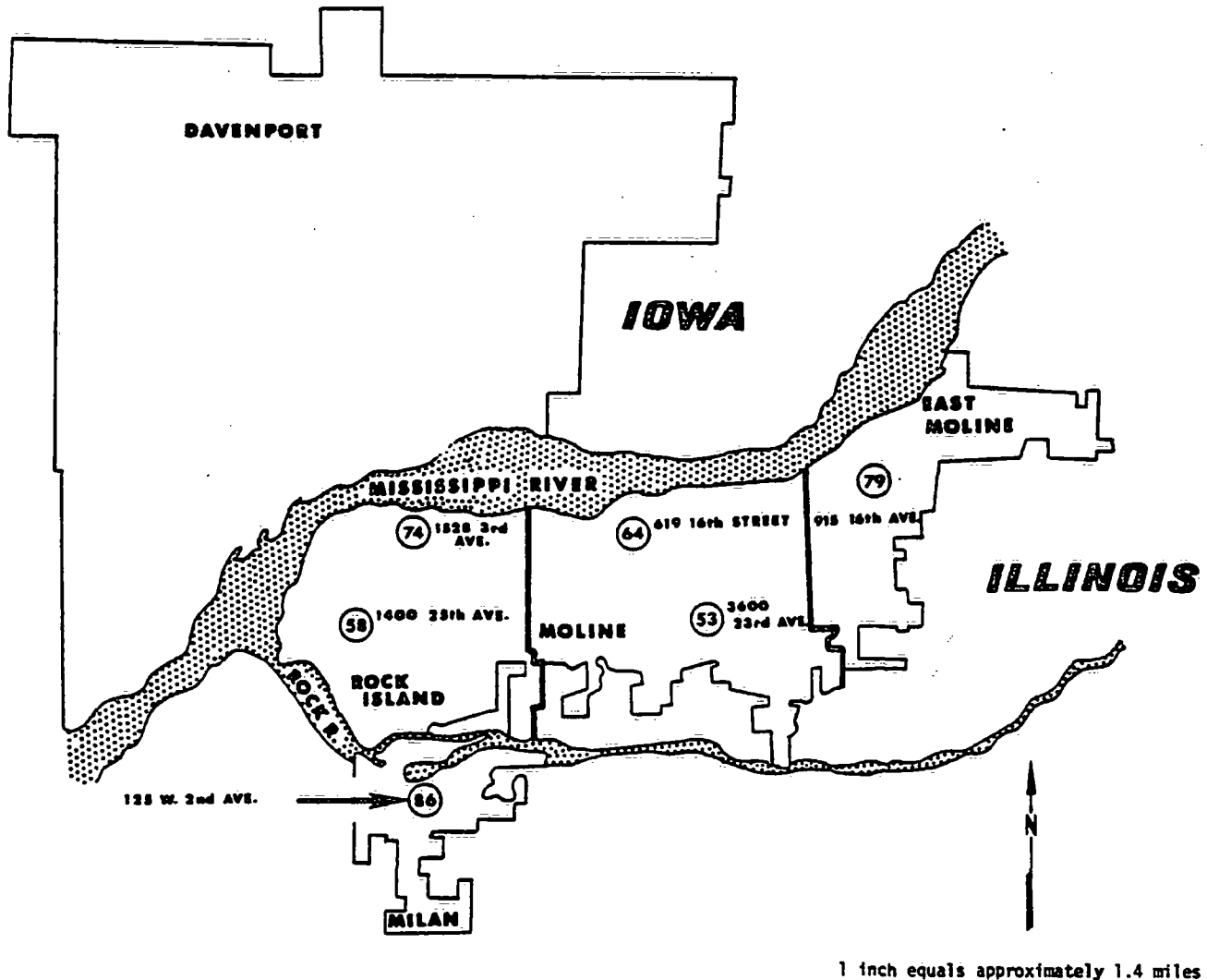


FIGURE 7

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>ROCK ISLAND COUNTY</u>										
East Moline	915 16th Ave.	59	4	0	249	178	169	155	79	1.56
Milan	125 W. 2nd Ave.	55	6	1	300	169	165	162	86	1.57
Moline	619 16th Ave.	56	2	1	330	191	148	137	64	1.58
Moline (RASN)	619 16th Ave.	5	0	0	77	63	53	48	*	
Moline	3600 23rd Ave.	54	0	0	131	126	108	108	53	1.51
Rock Island (RASN)	1528 3rd Ave.	32	2	0	171	168	123	115	74	1.52
Rock Island	1400 25th Ave.	50	1	0	200	117	110	103	58	1.52
<u>WHITESIDE COUNTY</u>										
Rock Falls	101 12th Ave.	46	0	0	140	136	136	111	60	1.51
Sterling	110 W. 5th St.	18	0	0	134	125	93	90	*	

**SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES**

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>ROCK ISLAND COUNTY</u>								
East Moline	915 16th Ave.	-	96	87	85	82	79	79
Milan	125 W. 2nd Ave.	-	-	*	96	99	90	86
Moline	619 16th Ave.	*	83	*	71	80	81	64
Moline	3600 23rd Ave.	-	-	*	60	52	54	53
Rock Island (RASN)	1528 3rd Ave.	90	80	81	72	68	70	74
Rock Island	1400 25th Ave.	-	-	*	70	61	61	58
<u>WHITESIDE COUNTY</u>								
Rock Falls	101 12th Ave.	-	-	-	*	*	*	60
Sterling	110 W. 5th St.	-	57	42	*	62	71	*

SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3 - HR	24 - HR	3 - HR. AVG.		24 - HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS	AVGS	1st	2nd	1st	2nd		
ROCK ISLAND COUNTY											
East Moline	915 16th Ave.		55	NA	0	NA	NA	.020	.019	.004	1.92
Rock Island	1504 3rd Ave.	6552		0	0	.068	.060	.029	.027	*	

NA - Not applicable

* - Did not meet minimum statistical culling criteria (see section 4.1).

- Site not in operation during year shown.

1977
NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>ROCK ISLAND COUNTY</u> East Moline	915 16th Ave.		56	.026	.033	.028	.023	.027	1.33

OZONE
(PARTS PER MILLION)

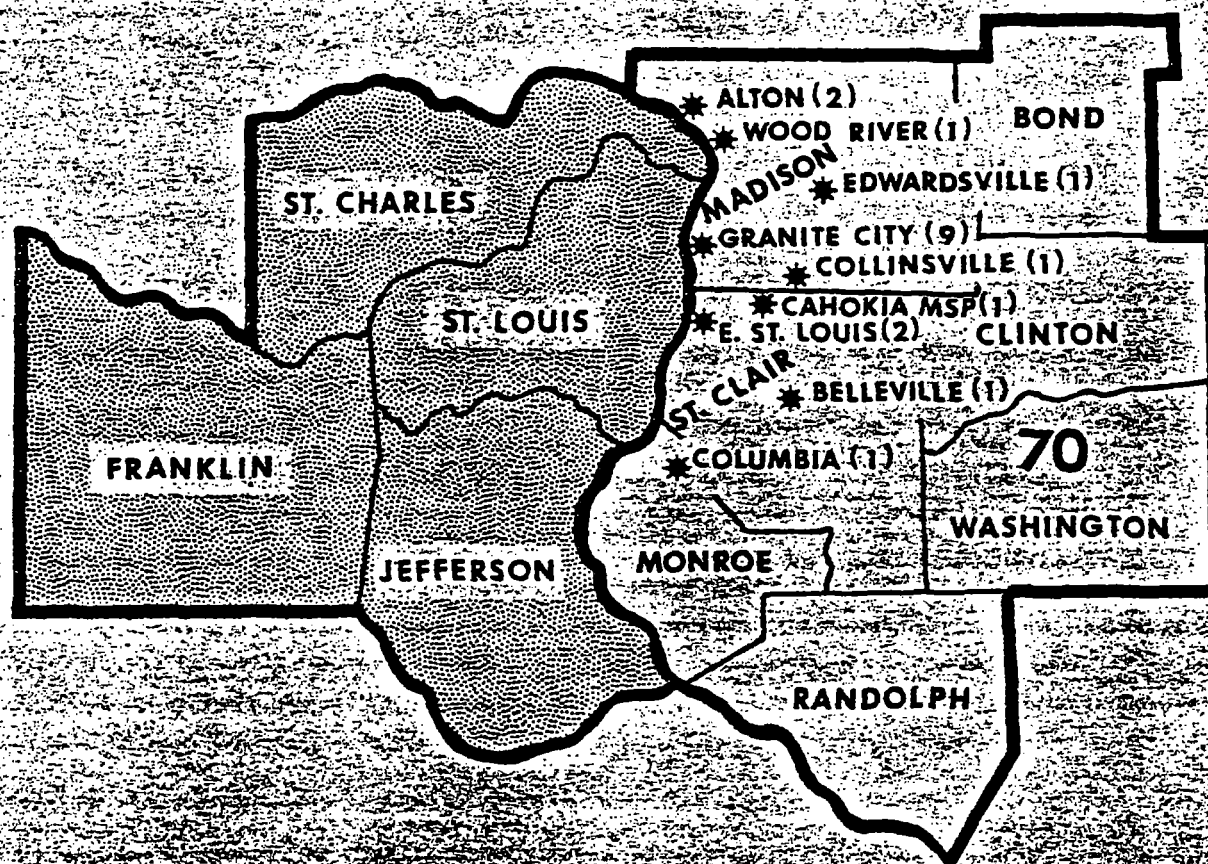
STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)									
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	ANNUAL	
												1st	2nd
<u>ROCK ISLAND COUNTY</u> Rock Island	1504 3rd Ave.	5502	56	.052	.064	.167 (42)	.088 (3)	.100 (6)	.086 (1)	.105 (4)	.048	.167	.146

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

CARBON MONOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO OF SAMPLES	NUMBER OF AVERAGES		HIGHEST					
			1 - HR > 35 PPM	8 - HR > 9 PPM	1-HR AVERAGE			8-HR AVERAGE		
					1st	2nd	3rd	1st	2nd	3rd
<u>ROCK ISLAND COUNTY</u> Rock Island	1504 3rd Ave.	7270	0	0	12.2	11.2	10.6	8.9	8.2	6.7

**AIR QUALITY CONTROL REGION 70
METROPOLITAN ST. LOUIS INTERSTATE
(ILLINOIS-MISSOURI)**



Data for the Missouri portion of this control region can be obtained from:
Missouri Department of Natural Resources,
Division of Environmental Quality,
P.O. Box 176, 117 Commerce Drive,
Jefferson City, Missouri 65101
(314) 751-3241

(The number of sampling sites in each city is shown in parenthesis following the city name.)

METROPOLITAN ST. LOUIS INTERSTATE (ILLINOIS - MISSOURI)
AIR QUALITY CONTROL REGION (AQCR) 70

TOTAL SUSPENDED PARTICULATES

Out of a total of 16 sites having valid annual averages, 13 (81%) were in excess of the annual primary standard. All 9 sites in Granite City, including the two special purpose sites, were above the annual primary standard. The highest annual average in the region, as well as, in the State for 1977 was 186 ug/m^3 recorded at 2001 East 20th Street in Granite City. In fact, 7 of the 9 Granite City sites were ranked in the highest ten in the State in 1977. Figures 8 and 9 list the annual means for sites in the St. Louis metro-east area and Granite City, respectively.

Of the 18 sites in the Region, 9 (50%) recorded at least one excursion of the 24-hour primary standard and 6 of those 9 recorded more than one excursion and are in violation of the standard. All of the sites in violation, except one (Wood River), are in Granite City. The site at 2001 East 20th Street in Granite City recorded the most excursions, 16 (15 violations). It also recorded the highest 24-hour sample of 592 ug/m^3 .

SULFUR DIOXIDE

None of the six sites at which sulfur dioxide was monitored in this region was above the primary annual standard of .03 ppm. Wood River had the highest average .025 ppm (highest in the State in 1977) followed by 2301 Adams in Granite City, with .023 ppm. Figure 10 is a map of the St. Louis metro-east area listing the annual averages.

Wood River recorded one excursion (no violations) of the 24-hour primary standard of .14 ppm, with a maximum 24-hour average of .194 ppm. This compares with 5 excursions (4 violations) in 1976. There were no excursions of the 3-hour secondary standard of .5 ppm. The highest 3-hour average was .378 ppm recorded in Alton.

NITROGEN DIOXIDE

All three sites having valid annual averages were below the primary annual standard of .05 ppm, with the highest average of .031 ppm being recorded in Granite City.

OZONE

Ozone was monitored at four sites during the entire 1977 ozone season in this AQCR. Wood River had the largest number of excursions of the 1-hour primary standard of .08 ppm in this AQCR and the State for 1977 with 388. Wood River also had the highest 1-hour average in this AQCR with .194 ppm. The distribution of excursions by month for sites in this AQCR was much more uniform than in other areas of the State.

CARBON MONOXIDE

Carbon monoxide data was recorded at three sites during 1977. However, the Granite City data represents sampling by one instrument that was moved in August to 2001 Edison. Thus, a complete year of data was not available at that site. The Edison site in Granite City recorded one excursion of the 8-hour primary standard of 9 ppm (0 violations). The highest 8-hour average was 9.4 ppm recorded at 2001 Edison in Granite City. The highest 1-hour average of 19.0 ppm, which is below the 1-hour standard of 35 ppm, was also recorded at this site.

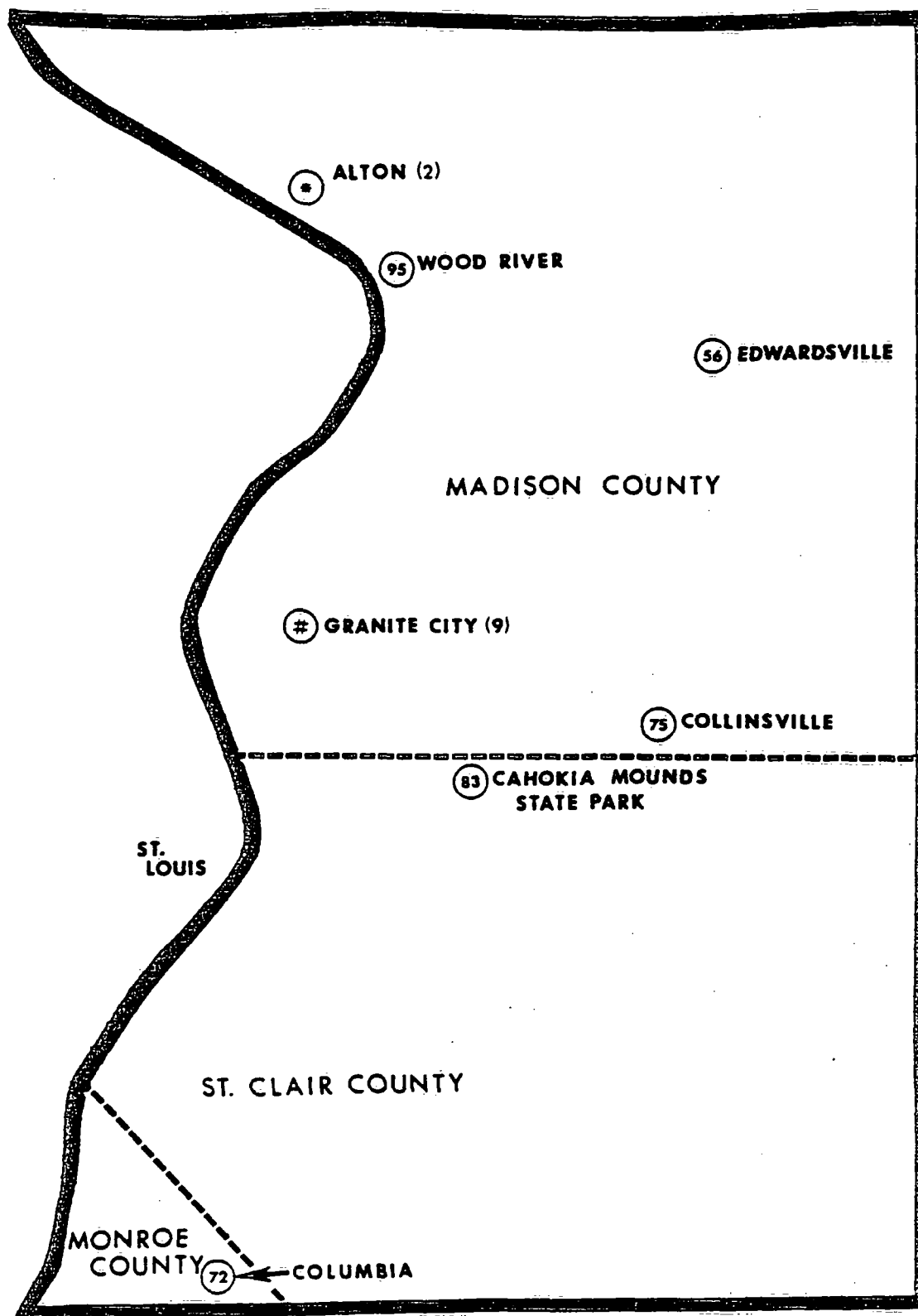
NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

ST. LOUIS METRO-EAST

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)



* Alton - 103 E. 3rd St. - 78
Alton - 2708 Edwards - 71

See Figure 9 for Granite City Data

1 inch equals approximately
4.5 miles

FIGURE 8

GRANITE CITY
TOTAL SUSPENDED PARTICULATES
ANNUAL GEOMETRIC MEAN
(MICROGRAMS PER CUBIC METER)

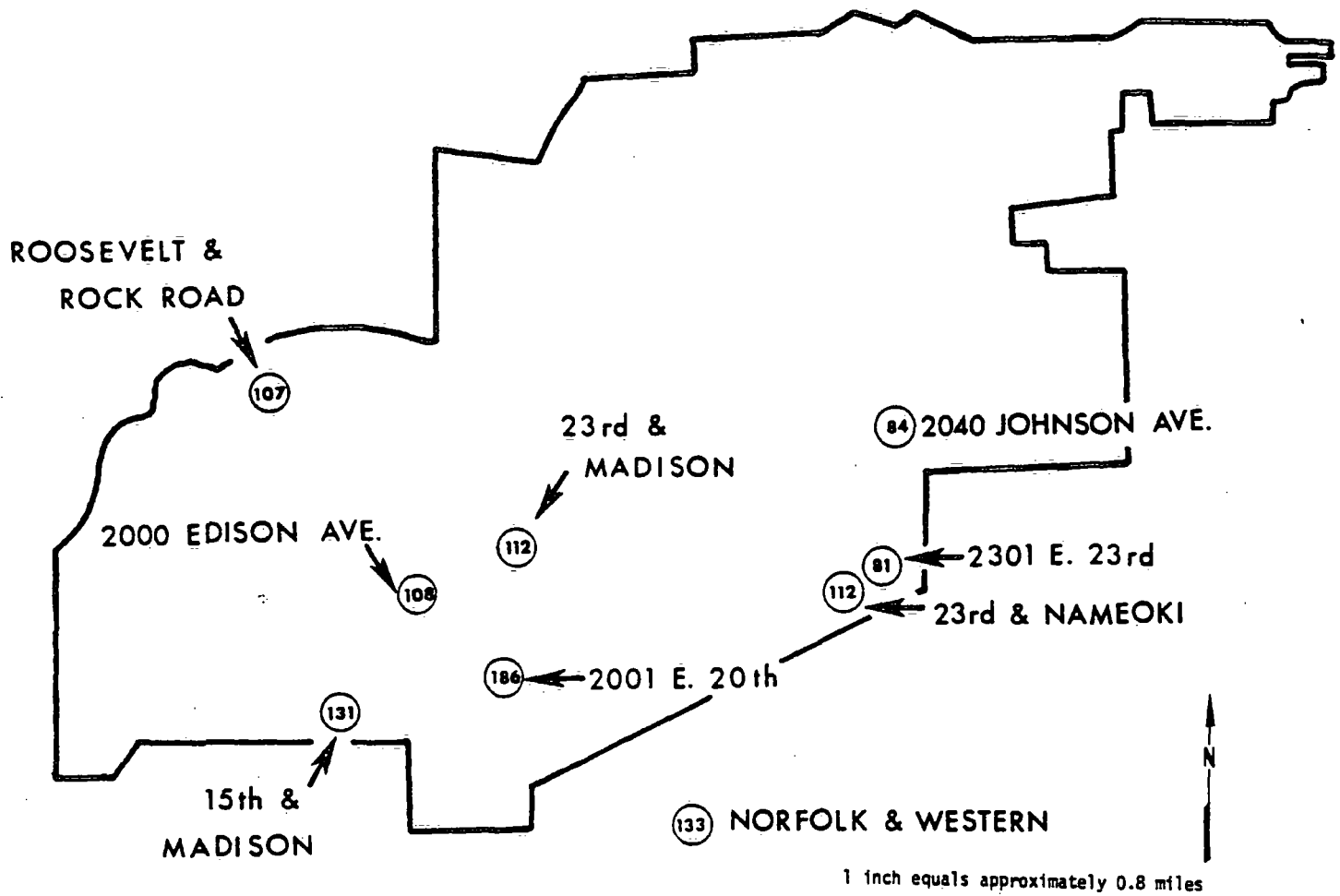
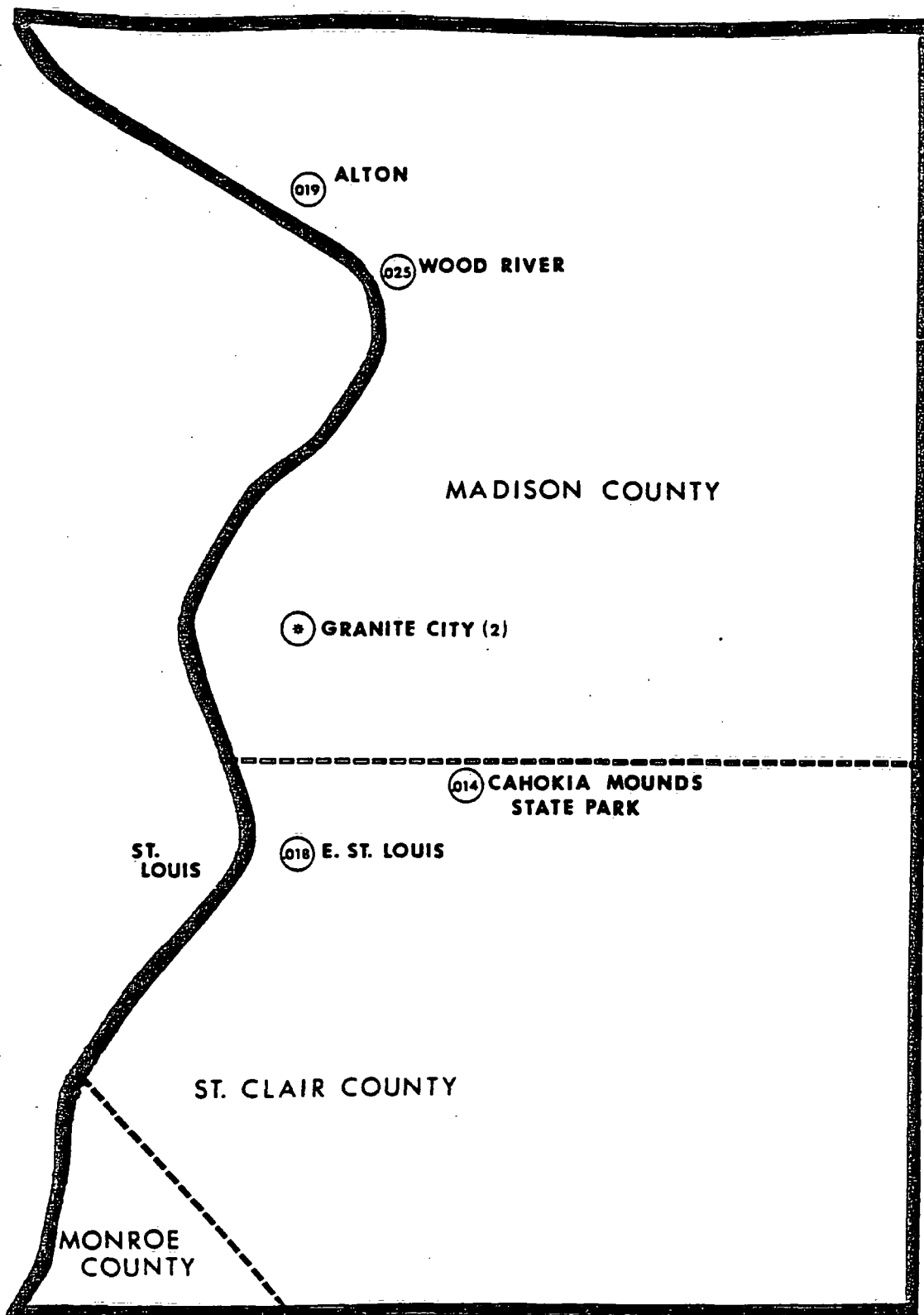


FIGURE 9

ST. LOUIS METRO-EAST

SULFUR DIOXIDE ANNUAL ARITHMETIC MEAN

(PARTS PER MILLION)



Granite City - 2000 Edison - .012
Granite City - 2301 Adams - .023

1 inch equals approximately
4.5 miles

FIGURE 10

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG/M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>MADISON COUNTY</u>										
Alton	103 E. 3rd St.	54	6	0	196	193	187	177	78	1.57
Alton	2708 Edwards	46	3	0	173	163	156	133	71	1.55
Collinsville	115A W. Main	56	5	0	175	165	165	153	75	1.48
Edwardsville	Main & Purcell	55	0	0	131	126	125	106	56	1.50
Granite City	2000 Edison	59	13	0	238	231	215	193	108	1.48
Granite City	23rd & Madison	54	17	3	385	276	270	237	112	1.72
Granite City	3201 E. 23rd	50	9	1	302	234	222	184	81	1.76
Granite City	2001 E. 20th	55	34	16	592	485	478	469	186	1.71
Granite City	15th & Madison	54	22	2	323	265	257	256	131	1.54
Granite City	Roosevelt & Rock Rd.	54	11	1	274	239	230	199	107	1.57
Granite City	2040 Johnson Ave.	55	4	0	227	226	159	152	84	1.57
Granite City	Norfolk & Western	74	34	6	408	363	362	359	133	1.70
Granite City	23rd & Nameoki	68	19	5	417	351	341	340	112	1.74
Wood River	54 N. Walcott	56	10	2	437	372	233	208	95	1.66
<u>MONROE COUNTY</u>										
Columbia	208 S. Rapp	47	4	0	229	200	170	152	72	1.65
<u>ST. CLAIR COUNTY</u>										
Belleville	101 S. Illinois	22	1	0	182	134	131	122	*	
Cahokia State Park	Business Rte. 40	77	8	0	221	210	194	183	83	1.61
East St. Louis	7 Collinsville Ave.	32	4	1	361	165	163	161	*	

**SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES**

STATION	ADDRESS	ANNUAL MEAN (UG·M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>MADISON COUNTY</u>								
Alton	103 E. 3rd St.	80	88	69	69	78	84	78
Alton	2708 Edwards	-	-	-	-	-	-	71
Collinsville	115 A W. Main	85	67	60	66	68	76	75
Edwardsville	Main & Purcell	78	69	54	53	54	58	56
Granite City	2000 Edison	179	163	143	*	96	114	108
Granite City	23rd & Madison	127	124	110	93	105	123	112
Granite City	3201 E. 23rd	123	89	88	86	68	83	81
Granite City	2001 E. 20th	174	205	202	158	158	205	186
Granite City	15th & Madison	174	200	161	*	138	155	131
Granite City	Roosevelt & Rock Rd.	-	116	82	86	97	111	107
Granite City	2040 Johnson Ave.	-	-	-	-	-	*	84
Granite City	Norfolk & Western	-	-	-	-	*	139	133
Granite City	23rd & Nameoki	-	-	-	-	-	-	112
Wood River	54 N. Walcott	101	94	79	72	81	82	95
<u>MONROE COUNTY</u>								
Columbia	208 S. Rapp	72	64	51	59	47	65	72
<u>ST. CLAIR COUNTY</u>								
Belleville	101 S. Illinois	84	81	63	73	63	77	*
Cahokia State Park	Business Rt. 40	124	108	101	111	103	113	83
East St. Louis	7 Collinsville Ave.	105	110	87	89	80	90	*

* Did not meet minimum statistical culling criteria (See Section 4.1)

† Special Purpose Site

- Site not in operation during year shown.

1977
SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR	24-HR	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS	AVGS	1st	2nd	1st	2nd		
<u>MADISON COUNTY</u>											
Alton	2708 Edwards	7729		0	0	.378	.282	.123	.071	.019	2.53
Granite City	2000 Edison		55	NA	0	NA	NA	.031	.028	.012	2.23
Granite City	2301 Adams	7750		0	0	.222	.197	.139	.105	.023	2.58
Wood River	54 N. Walcott	8350		0	1	.332	.315	.194	.129	.025	2.78
			55	NA	0	NA	NA	.042	.038	.013	2.78
<u>ST. CLAIR COUNTY</u>											
Cahokia State Park	Business Rte. 40	8037		0	0	.170	.115	.070	.050	.014	2.18
East St. Louis	650 Missouri	8262		0	0	.275	.258	.103	.098	.018	2.45
			56	NA	0	NA	NA	.054	.050	.015	2.32

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>MADISON COUNTY</u>									
Granite City Wood River	2000 Edison 54 N. Walcott		58	.030	.030	.030	.032	.031	1.40
			56	.026	.025	.022	.021	.024	1.63
<u>ST. CLAIR COUNTY</u>									
Cahokia State Park East St. Louis	Business Rte. 40 650 Missouri	5793		.027	.031	*	*	*	
			57	.027	.033	.031	.026	.029	1.85

NA - Not applicable.

* - Did not meet minimum statistical culling criteria (See Section 4.1)

**1977
OZONE**
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)									
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	ANNUAL	
												1st	2nd
<u>MADISON COUNTY</u>													
Alton	2708 Edwards	5468	148	NS	.141 (10)	.133 (44)	.105 (2)	.175 (73)	.136 (8)	.111 (11)	.079	.175	.159
Wood River	54 N. Walcott	8313	388	.077	.097 (10)	.163 (111)	.194 (73)	.186 (133)	.129 (36)	.176 (22)	.088 (3)	.194	.187
<u>ST. CLAIR COUNTY</u>													
Cahokia Mounds	Business Rt. 40	7301	257	.077	.087 (2)	.137 (108)	.135 (46)	.121 (68)	.118 (21)	.109 (12)	.061	.137	.136
East St. Louis	650 Missouri	7555	137	.049	.089 (6)	.113 (30)	.114 (35)	.130 (43)	.147 (20)	.091 (3)	.046	.147	.144

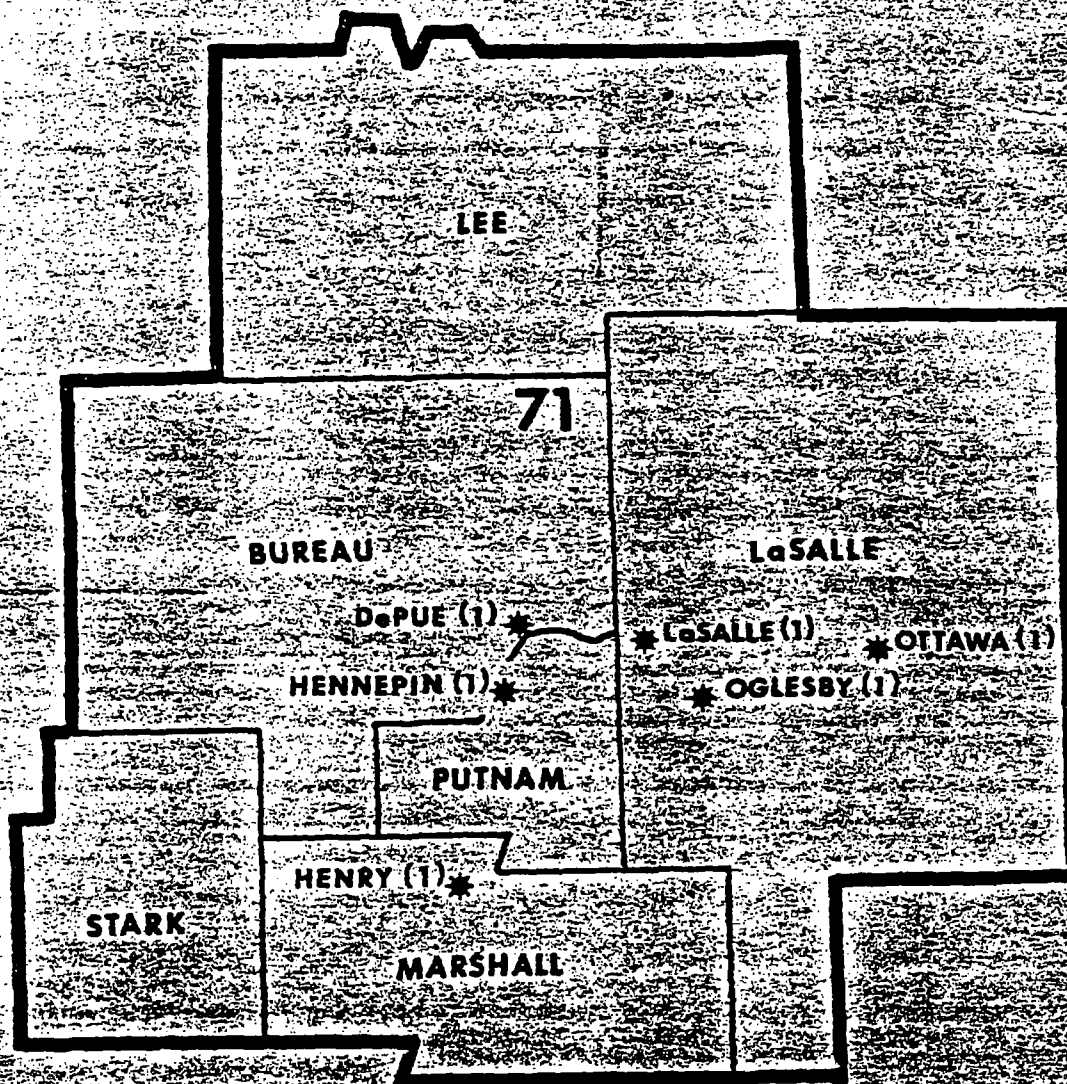
Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

CARBON MONOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO OF SAMPLES	NUMBER OF AVERAGES		HIGHEST					
			1 - HR > 35 PPM	8 - HR > 9 PPM	1-HR AVERAGE			8-HR AVERAGE		
					1st	2nd	3rd	1st	2nd	3rd
<u>MADISON COUNTY</u>										
Granite City	2001 Edison	2591	0	1	19.0	15.6	13.8	9.4	9.0	8.4
Wood River	54 N. Walcott	7615	0	0	9.0	8.0	7.8	5.9	4.9	4.4
<u>ST. CLAIR COUNTY</u>										
Cahokia Mounds	Business Rt. 40	7673	0	0	11.5	6.6	6.1	5.6	5.1	5.0

NS - No samples

**AIR QUALITY CONTROL REGION 71
NORTH CENTRAL ILLINOIS INTRASTATE**



(The number of sampling sites in each city is shown in parenthesis following the city name.)

NORTH CENTRAL ILLINOIS INTRASTATE
AIR QUALITY CONTROL REGION (AQCR) 71

TOTAL SUSPENDED PARTICULATES

Oglesby with an annual mean of 91 ug/m^3 , was the only site of the four having valid annual averages that was above the primary annual standard of 75 ug/m^3 . The other three sites were below the annual secondary standard of 60 ug/m^3 .

A total of four sites (three of them special purpose) monitored for TSP in Oglesby during at least part of the year. Three of these sites recorded at least one excursion of the 24-hour primary standard and two sites, **Non-Responsive** recorded 11 excursions (10 violations) and 4 excursions (3 violations) respectively. Outside of Oglesby, DePue recorded one excursion (no violations). The maximum 24-hour sample was 517 ug/m^3 recorded at **Non-Responsive** in Oglesby.

SULFUR DIOXIDE

All three sites had annual means well below the primary annual standard of .03 ppm. There were no excursions of either the 3-hour or 24-hour standards recorded at the sites listed. However, industrial data showed excursions of both the 3-hour standard and 24-hour standard in 1977 (see section 6.0).

NITROGEN DIOXIDE

All three sites for which nitrogen dioxide data was available had annual averages well below the primary annual standard of .05 ppm, with Henry having the highest average with .020 ppm.

OZONE

The monitoring site in LaSalle recorded 161 excursions of the 1-hour primary standard of .08 ppm compared with only 51 excursions in 1976. Over 75% of the excursions occurred in May and July. The maximum 1-hour average was .151 ppm while in 1976 the maximum was .106 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG/M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>BUREAU COUNTY</u>										
DePue	Non-Responsive	51	2	1	267	156	102	96	58	1.61
<u>LA SALLE COUNTY</u>										
Oglesby	Non-Responsive 110 W. 2nd St. Maple & Watson 211 E. Main	116	32	11	430	412	396	395	91	2.17
Oglesby ¹		55	13	4	517	443	328	325	*	
Oglesby ¹		55	0	0	123	112	101	100	*	
Oglesby ¹		56	9	1	270	231	216	205	*	
Ottawa		52	1	0	169	137	103	103	54	1.47
<u>PUTNAM COUNTY</u>										
Hennepin	Non-Responsive	52	1	0	194	117	114	108	56	1.63

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>BUREAU COUNTY</u>								
DePue	Non-Responsive	80	68	65	61	58	63	58
<u>LA SALLE COUNTY</u>								
Oglesby	Non-Responsive 110 W. 2nd St. Maple & Watson 211 E. Main	-	-	-	-	-	*	91
Oglesby ¹		-	-	-	-	-	-	*
Oglesby ¹		-	-	-	-	-	-	*
Oglesby ¹		-	-	-	-	-	-	*
Ottawa		-	-	-	*	55	64	54
<u>PUTNAM COUNTY</u>								
Hennepin	Non-Responsive	54	55	46	48	48	53	56

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

¹ Special Purpose Site

**1977
SULFUR DIOXIDE**
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR. AVG.	24-HR. AVG.	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				>.5	>.14	1st	2nd	1st	2nd		
<u>LA SALLE COUNTY</u>											
LaSalle	541 Chartres	8122		0	0	.144	.086	.061	.038	.009	1.82
			50	NA	0	NA	NA	.015	.011	.004	1.73
Ottawa	211 E. Main		48	NA	0	NA	NA	.032	.010	.004	1.88
<u>MARSHALL COUNTY</u>											
Henry	Route 29		44	NA	0	NA	NA	.048	.039	.007	2.55

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>LA SALLE COUNTY</u>									
LaSalle	541 Chartres		49	.016	.014	.016	.018	.016	1.43
Ottawa	211 E. Main		51	.015	.014	.012	.011	.013	1.81
<u>MARSHALL COUNTY</u>									
Henry	Route 29		45	.020	.017	.018	.028	.020	1.93

OZONE
(PARTS PER MILLION)

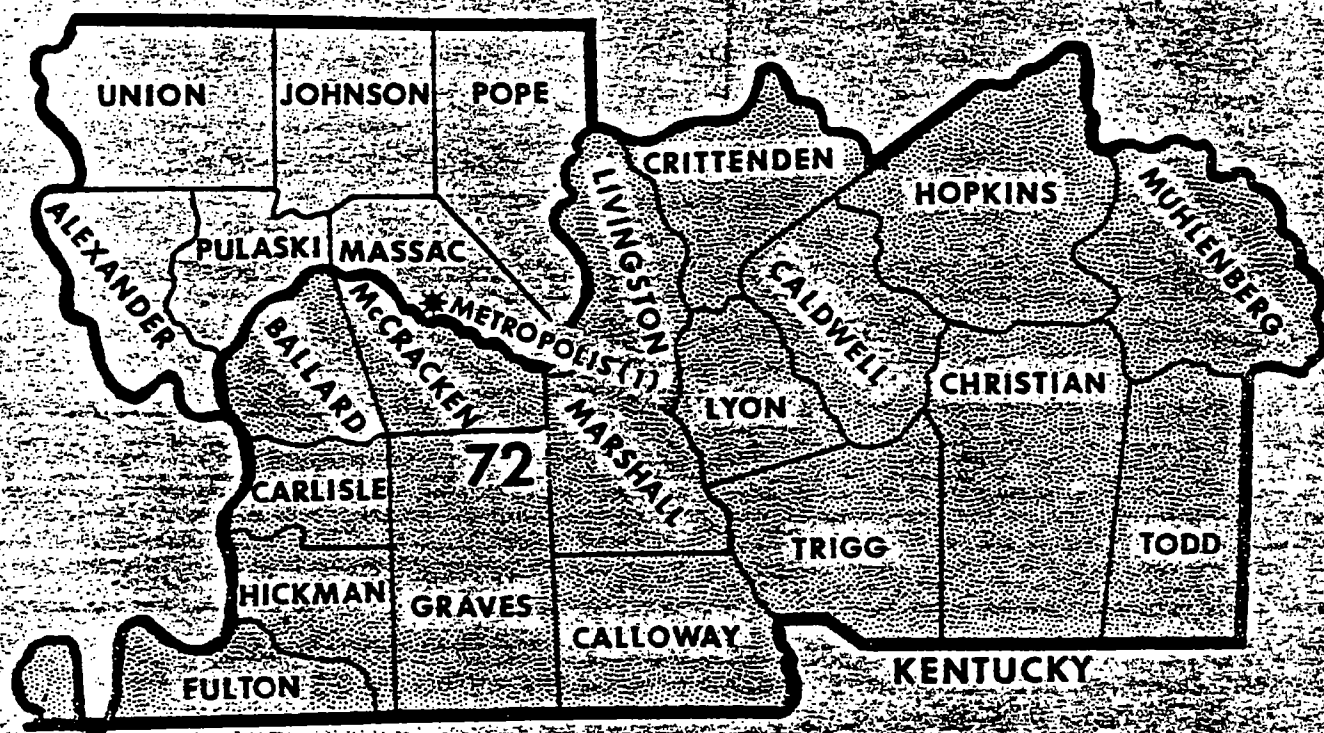
STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)									
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	ANNUAL	
												1st	2nd
<u>LA SALLE COUNTY</u> LaSalle	541 Chartres	8285	161	.055	.075	.151 (79)	.113 (37)	.126 (44)	.078	.091 (1)	.050	.151	.131

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

NA - Not applicable.

* - Did not meet minimum statistical culling criteria (See Section 4.1)

AIR QUALITY CONTROL REGION 72 PADUCAH-CAIRO INTERSTATE (KENTUCKY-ILLINOIS)



Data for the Kentucky portion of this control region can be obtained from
Kentucky Environmental Protection Agency,
Capitol Plaza Tower,
Frankfort, Kentucky 40601
(502) 564-3382

(The number of sampling sites in each city is shown in parenthesis
following the city name.)

PADUCAH - CAIRO INTERSTATE (KENTUCKY - ILLINOIS)
AIR QUALITY CONTROL REGION (AQCR) 72

TOTAL SUSPENDED PARTICULATES

The only site in this Region, Metropolis, did not have a sufficient number of samples for a valid annual mean. Industrial data indicated that annual means in Metropolis were less than the annual secondary standard of 60 ug/m^3 (see section 6.0). The State site in Metropolis did record one excursion (0 violation) of the 24-hour primary standard of 260 ug/m^3 with a maximum value of 350 ug/m^3 .

SULFUR DIOXIDE

The site in Metropolis did not have sufficient data for a valid annual average. There were no excursions of the 24-hour primary standard of .14 ppm at this site. The maximum 24-hour average was .135 ppm. In addition, industrial data showed that excursions of both the 24-hour primary and 3-hour secondary standards occurred in this AQCR in 1977 (see section 6.0).

NITROGEN DIOXIDE

The site in Metropolis did not record sufficient data to obtain a valid annual average.

OZONE, CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available in Illinois portion of this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG/M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>MASSAC COUNTY</u> Metropolis	Massac County Hospital	21	7	1	350	217	213	195	*	

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>MASSAC COUNTY</u> Metropolis	Massac County Hospital	*	-	-	*	53	*	*

SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR AVGS	24-HR AVGS	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				>.5	>.14	1st	2nd	1st	2nd		
<u>MASSAC COUNTY</u> Metropolis	Massac County Hospital		26	NA	0	NA	NA	.135	.098	*	

NITROGEN DIOXIDE
(PARTS PER MILLION)

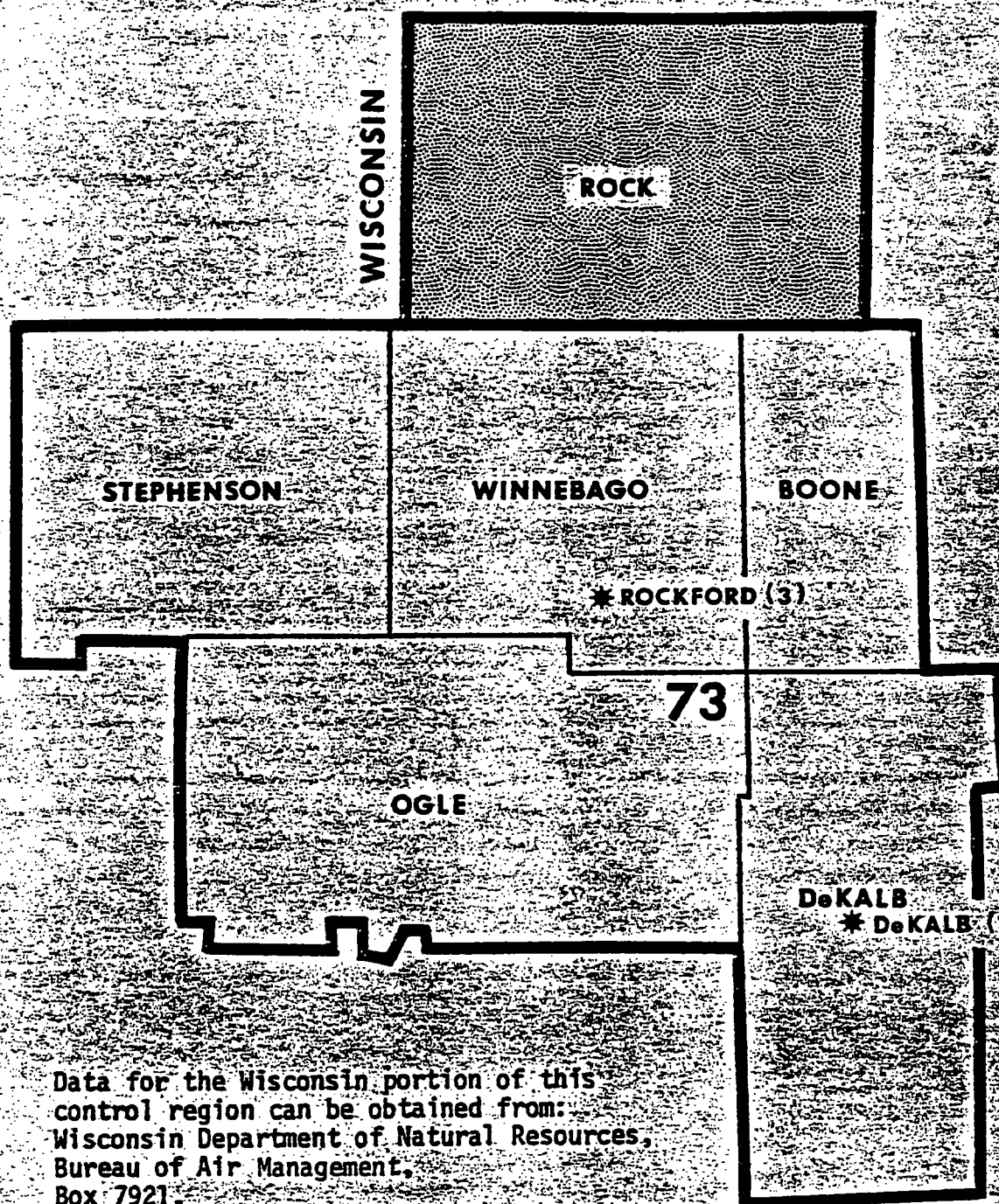
STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>MASSAC COUNTY</u> Metropolis	Massac County Hospital		25	.018	*	.011	*	*	

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

NA - Not applicable

**AIR QUALITY CONTROL REGION 73
ROCKFORD-JANESVILLE-BELOIT INTERSTATE
(ILLINOIS-WISCONSIN)**



Data for the Wisconsin portion of this control region can be obtained from:
Wisconsin Department of Natural Resources,
Bureau of Air Management,
Box 7921,
Madison, Wisconsin 53707
(608) 266-0603

(The number of sampling sites in each city is shown in parenthesis following the city name.)

ROCKFORD - JANESVILLE - BELOIT INTERSTATE (ILLINOIS - WISCONSIN)
AIR QUALITY CONTROL REGION (AQCR) 73

TOTAL SUSPENDED PARTICULATES

All three sites in this Region had annual geometric means below the annual secondary standard of 60 ug/m^3 . The maximum was 56 ug/m^3 recorded in DeKalb. The site in DeKalb also recorded one excursion (no violations) of the 24-hour primary standard with a value of 435 ug/m^3 .

SULFUR DIOXIDE

The only site in this Region, Rockford, recorded an annual mean of .011 ppm, well below the primary annual standard of .03 ppm. Additionally, there were no excursions of the 24-hour primary or the 3-hour secondary standard.

NITROGEN DIOXIDE

The only site in this Region, Rockford, recorded an annual mean of .020 ppm, well below the annual primary standard of .05 ppm.

OZONE

The monitoring site in DeKalb recorded 180 excursions of the 1-hour primary standard of .08 ppm. This was the most excursions measured in this Region. The highest 1-hour average was .172 ppm, also measured in DeKalb. The highest 1-hour average recorded at Rockford was .123 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG. M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>DeKALB COUNTY</u>										
DeKalb	200 S. 4th	43	2	1	435	179	103	91	56	1.67
<u>WINNEBAGO COUNTY</u>										
Rockford	2525 Ohio	51	1	0	187	149	90	79	44	1.56
Rockford	126 S. 1st St.	40	0	0	143	128	103	102	55	1.56

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>DeKALB COUNTY</u>								
DeKalb	200 S. 4th	94	74	65	65	65	*	56
<u>WINNEBAGO COUNTY</u>								
Rockford	2525 Ohio	71	72	63	*	41	53	44
Rockford	126 S. 1st St.	*	*	54	50	51	60	55

SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR	24-HR	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS	AVGS	1st	2nd	1st	2nd		
				>.5	>.14						
<u>WINNEBAGO COUNTY</u>											
Rockford	1528 18th Ave.	7822	42	0 NA	0 0	.166 NA	.087 NA	.076 .026	.053 .016	.011 .004	1.99 2.09

NA - Not applicable

* - Did not meet minimum statistical culling criteria (see section 4.1).

1977
NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>WINNEBAGO COUNTY</u> Rockford	1528 18th Ave.		47	.019	.021	.021	.020	.020	1.44

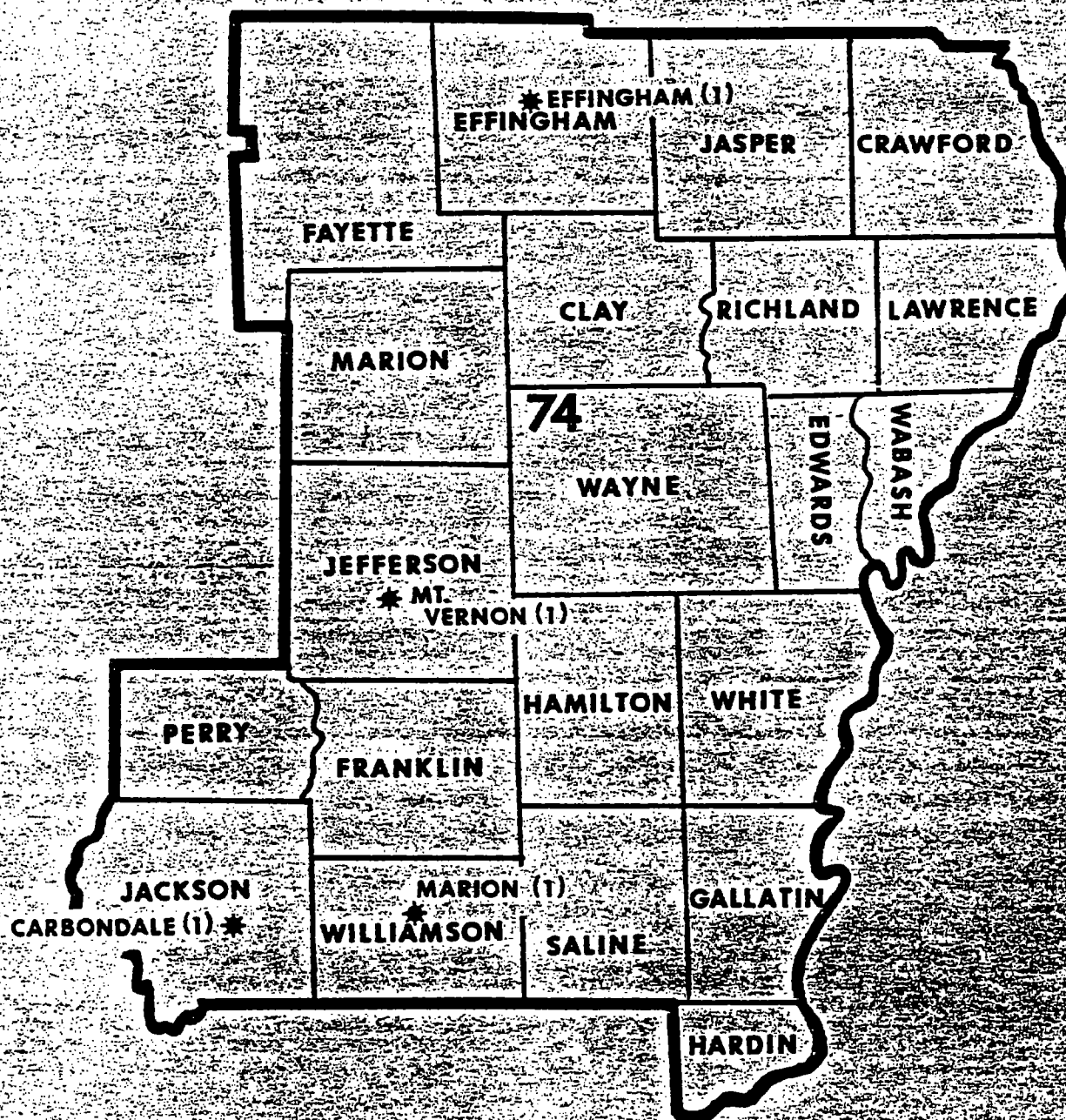
OZONE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)									
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	ANNUAL	
												1st	2nd
<u>DeKALB COUNTY</u> DeKalb ¹	Faraday Hall	4079	180	NS	NS	.172 (118)	.124 (37)	.105 (25)	.057	.072	.035	.172	.165
<u>WINNEBAGO COUNTY</u> Rockford	1528 18th Avenue	8202	70	.054	.079	.123 (29)	.100 (16)	.113 (25)	.080	.063	.056	.123	.120

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

¹Special Purpose Site

AIR QUALITY CONTROL REGION 74 SOUTHEAST ILLINOIS INTRASTATE



(The number of sampling sites in each city is shown in parenthesis following the city name.)

74

SOUTHEAST ILLINOIS INTRASTATE
AIR QUALITY CONTROL REGION (AQCR) 74

TOTAL SUSPENDED PARTICULATES

The only site in this Region above the annual primary standard of 75 ug/m^3 was Carbondale, with an average of 77 ug/m^3 . The other three sites were either equal to or less than the annual secondary of 60 ug/m^3 . No excursions of the 24-hour primary standard were recorded during 1977.

SULFUR DIOXIDE

Neither of the two sites, with valid annual averages in this Region, was above the primary annual standard; Marion had the highest average at .014 ppm. The short-term standards were not exceeded at either site. The highest 24-hour average was .115 ppm recorded in Marion.

NITROGEN DIOXIDE

The two sites (Carbondale and Marion) recording valid annual averages in this Region were well below the annual primary standard of .05 ppm. The annual and quarterly averages at these sites were nearly identical, with the annual average at Carbondale being .016 ppm and at Marion .015 ppm.

OZONE

The monitoring site in Marion recorded 188 excursions of the 1-hour primary standard of .08 ppm in 1977 compared with only 9 in 1976. The highest 1-hour average was .179 ppm. In 1976 the maximum value was .117 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M3	>260 UG M3	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>EFFINGHAM COUNTY</u>										
Effingham	1015 S. Willow	36	1	0	158	138	127	119	57	1.60
<u>JACKSON COUNTY</u>										
Carbondale	306 W. Main St.	33	2	0	251	186	129	121	77	1.50
<u>JEFFERSON COUNTY</u>										
Mt. Vernon	601 N. 18th St.	51	2	0	179	163	121	121	59	1.67
<u>WILLIAMSON COUNTY</u>										
Marion	2209 W. Main St.	49	2	0	196	171	140	136	60	1.65

SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>EFFINGHAM COUNTY</u>								
Effingham	1015 S. Willow	-	-	-	-	58	59	57
<u>JACKSON COUNTY</u>								
Carbondale	306 W. Main St.	-	-	-	-	-	-	77
<u>JEFFERSON COUNTY</u>								
Mt. Vernon	601 N. 18th St.	-	-	-	-	*	58	59
<u>WILLIAMSON COUNTY</u>								
Marion	2209 W. Main St.	-	-	-	*	46	50	60

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

1977
SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3-HR AVGS > .5	24-HR AVGS > .14	3-HR. AVG.		24-HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
						1st	2nd	1st	2nd		
<u>EFFINGHAM COUNTY</u> Effingham	1015 S. Willow		43	NA	0	NA	NA	.028	.019	*	
<u>JACKSON COUNTY</u> Carbondale	306 W. Main		32	NA	0	NA	NA	.033	.033	.009	2.46
<u>WILLIAMSON COUNTY</u> Marion	2209 W. Main	7973	53	0 NA	0 0	.201 NA	.152 NA	.115 .046	.093 .013	.014 .004	2.09 1.98

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>EFFINGHAM COUNTY</u> Effingham	1015 S. Willow		45	.014	.013	.014	*	*	
<u>JACKSON COUNTY</u> Carbondale	306 W. Main		32	.017	.012	.017	.016	.016	1.67
<u>WILLIAMSON COUNTY</u> Marion	2209 W. Main		55	.015	.016	.015	.014	.015	1.84

OZONE
(PARTS PER MILLION)

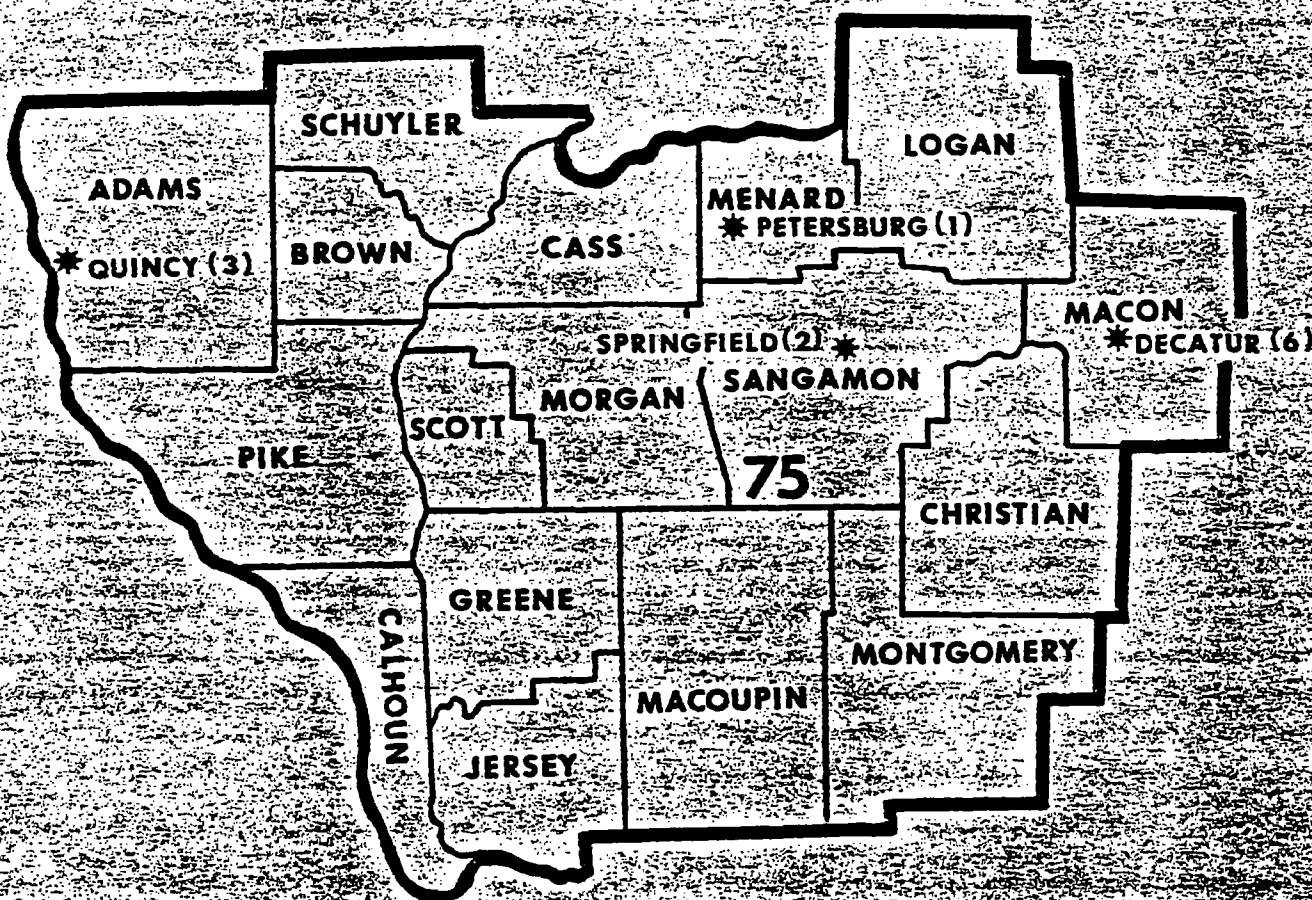
STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)										ANNUAL	
		TOTAL	> .08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT			1st	2nd
<u>WILLIAMSON COUNTY</u> Marion	2209 W. Main St.	6418	188	.072	.085 (7)	.097 (22)	.103 (39)	.179 (98)	.102 (22)	.061	.068			.179	.157

NA - Not applicable.

* - Did not meet minimum statistical culling criteria (See Section 4.1)

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month

AIR QUALITY CONTROL REGION 75 WEST CENTRAL ILLINOIS INTRASTATE



(The number of sampling sites in each city is shown in parenthesis following the city name.)

WEST CENTRAL ILLINOIS INTRASTATE
AIR QUALITY CONTROL REGION (AQCR) 75

TOTAL SUSPENDED PARTICULATES

In this Region seven sites had valid annual averages. Two (both in Decatur) were above the primary annual standard of 75 ug/m^3 with the highest being at Jasper and Orchard with an annual mean of 101 ug/m^3 . The same two sites in Decatur were also the only sites to record excursions of the 24-hour primary standard of 260 ug/m^3 . The site at 22nd and Geddes recorded one excursion (no violations) and the site at Jasper and Orchard recorded four excursions (3 violations). Figure 11 lists the annual geometric means for sites in Decatur.

SULFUR DIOXIDE

There were no excursions of the primary or secondary standards at any of the monitoring sites in this Region during 1977. The special purpose site at 712 South Dirksen in Springfield recorded the highest annual mean, 24-hour average, and 3-hour average in this region with values of .016 ppm, .081 ppm and .278 ppm respectively.

NITROGEN DIOXIDE

All three sites recorded annual averages well below the primary annual standard of .05 ppm. Springfield had the highest average at .023 ppm.

OZONE

All three monitoring sites in this Region recorded more than 100 excursions of the 1-hour primary standard of .08 ppm; Quincy had the most with 144. Springfield recorded the highest 1-hour average with a value of .160 ppm. All three sites recorded a significantly larger number of excursions in 1977 than in 1976.

CARBON MONOXIDE

The monitoring site in Springfield did not record excursions of either the 1-hour standard of 35 ppm or the 8-hour standard of 9 ppm. The highest 1-hour average recorded was 13.2 ppm and the highest 8-hour average was 5.1 ppm.

NON-METHANE HYDROCARBONS

Out of a total of 286 valid 6 - 9 a.m. averages collected at Springfield during the year, 117 (41%) were in excess of the 0.24 standard. The highest 6 - 9 a.m. average was 1.4 ppm.

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DECATUR
TOTAL SUSPENDED PARTICULATES
ANNUAL GEOMETRIC MEAN
(MICROGRAMS PER CUBIC METER)

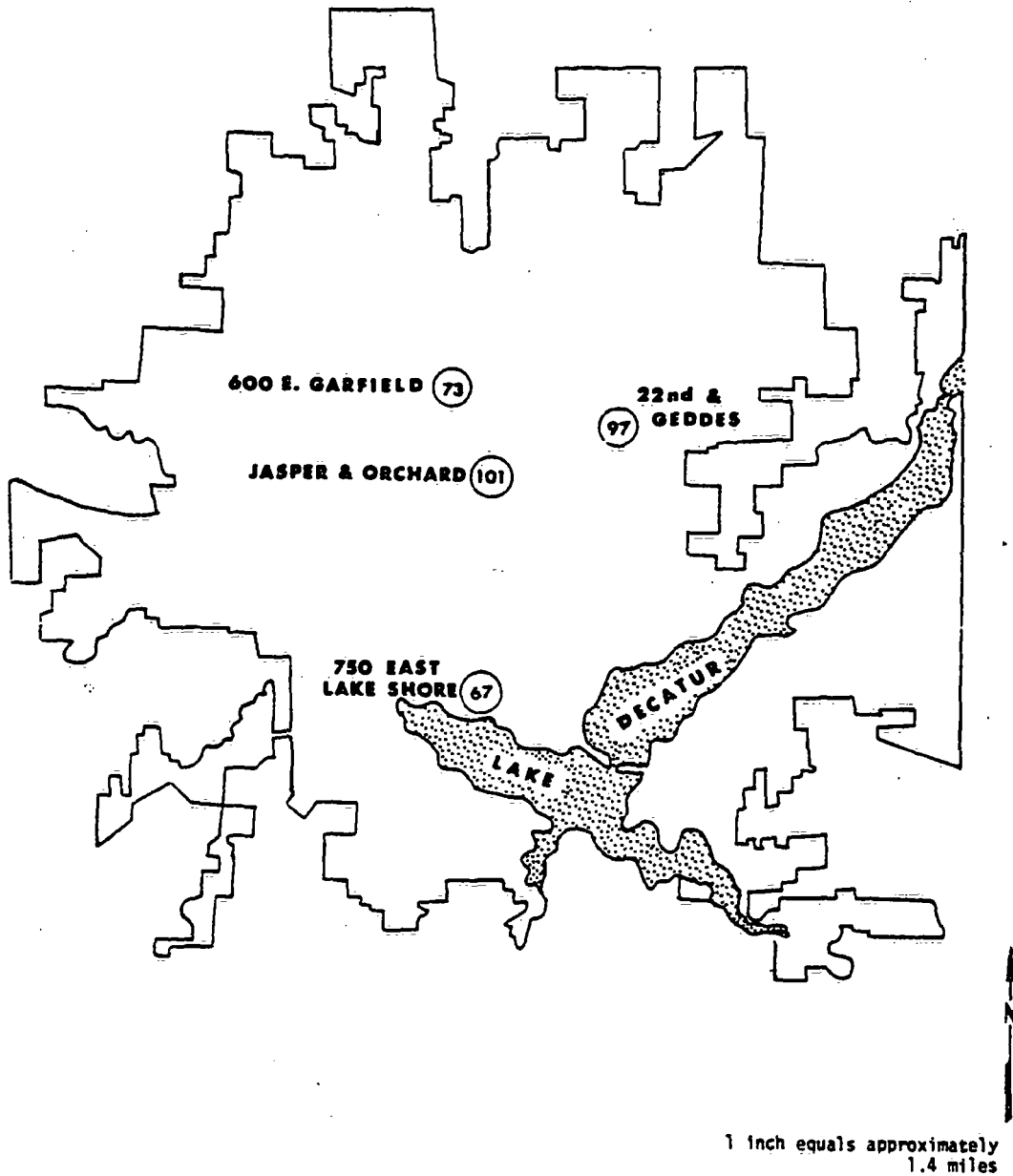


FIGURE 11

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG/M ³	>260 UG/M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
<u>ADAMS COUNTY</u>										
Quincy	9th and Vermont Sewage Plant	47	0	0	136	133	111	104	57	1.69
Quincy		44	3	0	228	165	158	148	*	
<u>MACON COUNTY</u>										
Decatur	22nd and Geddes	54	13	1	285	238	212	198	97	1.72
Decatur	600 East Garfield	57	5	0	254	191	179	178	73	1.72
Decatur	Jasper and Orchard	49	9	4	293	288	276	262	101	1.65
Decatur	750 East Lake Shore	47	2	0	188	181	149	123	67	1.66
Decatur ¹	24th and Locust	26	5	0	234	163	158	155	*	
Decatur ¹	1735 East Condit	28	7	0	232	201	169	169	*	
<u>MENARD COUNTY</u>										
Petersburg	7th and Jackson	55	1	0	152	141	128	125	58	1.65
<u>SANGAMON COUNTY</u>										
Springfield (RASN)	8th and Monroe	6	0	0	108	67	55	44	*	
Springfield	224 West Adams	56	3	0	206	185	153	150	72	1.54

**SHORT-TERM TRENDS FOR
TOTAL SUSPENDED PARTICULATES**

STATION	ADDRESS	ANNUAL MEAN (UG/M ³)						
		1971	1972	1973	1974	1975	1976	1977
<u>ADAMS COUNTY</u>								
Quincy	9th & Vermont	96	108	*	57	61	66	57
Quincy	Sewage Plant	85	96	89	81	61	*	*
<u>MACON COUNTY</u>								
Decatur	22nd & Geddes	-	81	112	98	105	122	97
Decatur	600 E. Garfield	105	83	65	60	66	81	73
Decatur	Jasper & Orchard	-	-	-	-	-	-	101
Decatur	750 E. Lake Shore Drive	-	-	-	-	-	-	67
Decatur ¹	24th & Locust	-	-	-	-	-	-	*
Decatur ¹	1735 E. Condit	-	-	-	-	-	-	*
<u>MENARD COUNTY</u>								
Petersburg	7th & Jackson	-	66	67	59	57	65	58
<u>SANGAMON COUNTY</u>								
Springfield	224 W. Adams	-	86	64	66	70	85	72
Springfield (RASN)	8th & Monroe	-	-	-	-	*	*	*

- Site not in operation during year shown.

* Did not meet minimum statistical culling criteria (see section 4.1)

¹ Special Purpose Site

1977
SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3 - HR	24 - HR	3 - HR. AVG.		24 - HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS >.5	AVGS >.14	1st	2nd	1st	2nd		
<u>ADAMS COUNTY</u>											
Quincy	9th & Vermont	7972		0	0	.143	.132	.050	.049	.009	2.45
Quincy	18th & Elm		40	NA	0	NA	NA	.020	.018	.006	2.19
<u>MACON COUNTY</u>											
Decatur	2760 N. 22nd St.	8015		0	0	.188	.174	.079	.077	.013	2.38
Decatur	Franklin & Wood		59	NA	0	NA	NA	.015	.013	.004	1.81
<u>SANGAMON COUNTY</u>											
Springfield	224 W. Adams	7971		0	0	.240	.165	.065	.055	.010	2.39
Springfield ¹	712 S. Dirksen	7734	59	NA	0	NA	NA	.073	.044	.007	2.53
				0	0	.278	.222	.081	.072	.016	3.11

NITROGEN DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	1st	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
<u>ADAMS COUNTY</u>									
Quincy	18th & Elm		41	.016	.018	.015	.013	.015	1.44
<u>MACON COUNTY</u>									
Decatur	Franklin & Wood		59	.019	.019	.021	.020	.020	1.27
<u>SANGAMON COUNTY</u>									
Springfield	224 W. Adams	8159	60	.021 .018	.024 .017	.023 .018	.025 .017	.023 .017	1.97 1.34

¹Special Purpose Site
NA - Not applicable.

**1977
OZONE**
(PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		HIGHEST SAMPLES (PPM)										ANNUAL	
		TOTAL	>.08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT			1st	2nd
<u>ADAMS COUNTY</u>															
Quincy	9th & Vermont	7845	144	.055	.074	.122 (54)	.125 (22)	.121 (44)	.135 (19)	.088 (5)	.067			.135	.129
<u>MACON COUNTY</u>															
Decatur	2760 N. 22nd St.	6164	102	.072	.088 (5)	.119 (46)	.115 (14)	.120 (35)	.073	.098 (2)	.072			.120	.119
<u>SANGAMON COUNTY</u>															
Springfield	224 W. Adams	7391	136	.055	.103 (16)	.129 (48)	.088 (6)	.160 (49)	.101 (8)	.101 (7)	.083 (2)			.160	.140

CARBON MONOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NO OF SAMPLES	NUMBER OF AVERAGES		HIGHEST					
			1 - HR > 35 PPM	8 - HR > 9 PPM	1-HR AVERAGE			8-HR AVERAGE		
					1st	2nd	3rd	1st	2nd	3rd
<u>SANGAMON COUNTY</u>										
Springfield	224 W. Adams	7777	0	0	13.3	9.2	8.1	5.1	4.1	3.8

NON - METHANE HYDROCARBONS
(PARTS PER MILLION)

STATION	ADDRESS	NO OF AVERAGES		HIGHEST AVERAGES (PPM) (6-9 am)											
		TOTAL 6-9am	>.24 6-9am	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
<u>SANGAMON COUNTY</u>															
Springfield	224 W. Adams	286	117	0.7	1.2	0.6	0.6	0.6	0.3	0.3	0.8	0.7	1.4	0.4	0.1

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

6.0
INDUSTRIAL MONITORING
DATA

6.0 INDUSTRIAL MONITORING DATA

The majority of the data presented in this Annual Report has been collected in the statewide monitoring network operated by the State, local agencies and the USEPA. A somewhat recent growth in the number of industrial monitoring sites has made the consideration of these networks an important factor in presenting a complete air quality profile for Illinois. A directory of the industrial monitoring sites which report their data to the IEPA can be found in Section 3.2b. In the coming year, an increased emphasis will be placed on both obtaining industrial monitoring data on a routine basis and performing periodic quality assurance inspections. Data has been summarized in this section for total suspended particulates and sulfur dioxide. These tables summarize data which was readily available at the time of the report but does not constitute all of the industrial data submitted to the IEPA. A computerized industrial data base is being developed to efficiently process industrial data and provide timely summaries.

6.1 TOTAL SUSPENDED PARTICULATE

Data from the four sites, with valid annual averages, show the geometric means to be below the secondary annual standard of 60 ug/m^3 . If these sites were ranked with the statewide network, they would have ranged from 94 - 123. The factors involved in the selection of a site which is designed to measure the impact from a limited sample of sources, often results in a relatively low annual mean. In the case of the sites shown here, it can be seen that the short-term 24 hour samples are all below the short-term primary standard, although all but one site is in violation of the secondary short-term standard.

6.2 SULFUR DIOXIDE

Several sulfur dioxide monitoring networks are currently in operation in the vicinity of large power plants. The only exception in this report is the two station network operated near the Mobil Chemical Plant in DePue. Commonwealth Edison (Com. Ed.) and the Central Illinois Light Company (CILCO) have a thirteen station network operating in the vicinity of Com. Ed. - Powerton Plant and CILCO - Edwards Plant in the Peoria - Pekin area. As can be seen from the data, no violations of the sulfur dioxide standards have been measured although one three-hour excursion (.504 ppm) was measured on July 23, 1977.

The two Waukegan monitors are the remnant of a ten station network which operated in the vicinity of the Com. Ed. - Waukegan Power Station from 1975 - 1977. The values reported in 1977 show no violations of any sulfur dioxide standard.

The Mobil Chemical Company in DePue operates a two-station sulfur dioxide monitoring network. The two 24-hour excursions reported from one site occurred during the severe cold weather of January 26 - 28, 1977 during which time production equipment at the plant malfunctioned due to the weather conditions.

The Tennessee Valley Authority (TVA) operates fourteen monitoring sites near its Shawnee Steam Plant located near Paducah, Kentucky. Six of these sites are located in Illinois. Although there are other sources of sulfur dioxide located in the area, the violations recorded at these sites can be related to the operation of the Shawnee Plant. An effort is currently underway at TVA to achieve compliance with the air quality standards. This will be accomplished by the construction of two 800 foot tall stacks (already complete) combined with a sulfur dioxide emission reduction program.

The last network shown in the summary tables is operated in the vicinity of the Com. Ed. - Kincaid Power Station. The data collected to date shows all values well below applicable standards.

Increased efforts in the coming year should result in an industrial data base for 1978 which would include well over 100 total suspended particulate and 100 sulfur dioxide sites. Data from these sites will provide vital information in areas which do not receive intensive monitoring in the statewide network. Our sincere thanks are extended to the following companies for their assistance and cooperation in making these data available:

Commonwealth Edison Company
Central Illinois Light Company
Tennessee Valley Authority
Mobil Chemical Company

1977
SULFUR DIOXIDE IN EXCESS OF THE PRIMARY (24-HOUR)
AND SECONDARY (3-HOUR) SHORT TERM STANDARDS*

STATION	ADDRESS	DATE	AVERAGING TIME	NUMBER* OF EXCURSIONS	TIME PERIOD	MAXIMUM AVERAGE (PPM)
65 BURLINGTON-KEOKUK INTERSTATE (IOWA - ILL.)						
State Hospital	Peoria Co. - Com. Ed./Cilco	July 23	3-Hour	1	0900-1200	.504
71 NORTH CENTRAL ILLINOIS INTRASTATE						
DePue - SW Plant	Bureau Co. - Mobil Chemical	October 22	3-Hour	1	1900-2300	.512
		October 21-23	24-Hour	1	2000-1300	.205
		November 4-5	24-Hour	1	0800-1600	.179
DePue - White City	Bureau Co. - Mobil Chemical	January 28-29	24-Hour	1	1100-1900	.157
		January 30-31	24-Hour	1	0900-1900	.162
72 PADUCAH-CAIRO INTERSTATE (KY. - ILL.)						
Station 10	Massac County - TVA	February 22	3-Hour	2	0600-1300	1.13
		February 22	24-Hour	1	0000-2400	0.27
		April 28	24-Hour	1	0000-2400	0.20
Station 11	Massac County - TVA	March 18	3-Hour	1	0500-0800	0.70
Station 16	Massac County - TVA	June 2	3-Hour	1	0900-1200	0.57
Station 18	Massac County - TVA	February 24	3-Hour	1	1500-1800	0.53
		February 24-25	3-Hour	1	2200-0100	0.51
		February 24	24-Hour	1	0000-2400	0.22
		March 18	3-Hour	1	0200-0500	0.51
Station 19	Massac County - TVA	February 22-23	3-Hour	1	2300-0300	0.62

*The 24-Hour Primary Standard is 0.14 parts per million; the 3-Hour Secondary Standard is 0.50 parts per million

*Non-overlapping averages greater than the Standard.

1977
TOTAL SUSPENDED PARTICULATES
(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS	
		TOTAL	>150 UG M ³	>260 UG M ³	1st	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION
REGION 67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)										
Lewis Site	Waukegan-Com Ed	116	5	0	197	178	173	159	56	1.67
Headquarters Site	Waukegan-Com Ed	129	2	0	175	167	138	136	45	1.76
REGION 70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)										
Granite City	19th and Adams	24	9	0	233	198	171	170	*	
REGION 72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)										
Station 10	Massac County-TVA	55	0	0	115	113	106	104	45	1.59
Station 11	Massac County-TVA	55	2	0	186	151	135	107	54	1.49

* Did not meet minimum statistical culling criteria (See Section 4.1).

1977
SULFUR DIOXIDE
(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS	
		1 HR	24 HR	3 - HR	24 - HR	3 - HR. AVG.		24 - HR. AVG.		ARITH. MEAN	STD. GEO. DEVIATION
				AVGS	AVGS	1st	2nd	1st	2nd		
REGION 65 BURLINGTON-KEOKUK INTERSTATE (ILL. - IOWA)											
Starr	Peoria-Com Ed/Cilco	8717	0	0	.273	.266	.094	.077	.011	-	
Allied Mills	Peoria County-Com Ed/Cilco	8739	0	0	.346	.276	.078	.070	.009	-	
Keystone	Peoria County-Com Ed/Cilco	8647	0	0	.207	.201	.054	.042	.007	-	
State Hospital	Peoria County-Com Ed/Cilco	8737	1	0	.504	.296	.100	.063	.009	-	
Limestone	Peoria County-Com Ed/Cilco	8722	0	0	.289	.277	.075	.071	.010	-	
Ozark	Peoria County-Com Ed/Cilco	8695	0	0	.251	.244	.068	.061	.008	-	
Hurst	Peoria County-Com Ed/Cilco	8731	0	0	.279	.243	.072	.044	.008	-	
Boswell	Peoria County-Com Ed/Cilco	8742	0	0	.295	.289	.113	.079	.009	-	
Gebhardt	Peoria County-Com Ed/Cilco	8736	0	0	.236	.202	.061	.054	.009	-	
Lawndale	Pekin-Com Ed/Cilco	8721	0	0	.191	.180	.049	.047	.008	-	
Park	Pekin-Com Ed/Cilco	8733	0	0	.222	.187	.041	.040	.009	-	
Lutz	Tazewell County-Com Ed/Cilco	8713	0	0	.231	.203	.061	.042	.005	-	
Garman	Tazewell County-Com Ed/Cilco	8697	0	0	.217	.200	.067	.051	.005	-	
REGION 67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)											
Lewis Site	Waukegan-Com Ed	7781	0	0	.083	.077	.036	.031	.008	1.73	
Headquarters Site	Waukegan-Com Ed	7831	0	0	.104	.058	.045	.043	.008	1.67	
REGION 71 NORTH CENTRAL ILLINOIS INTRASTATE											
DePue - SW Plant	Bureau County-Mobil Chemical	8095	1	2	.512	.403	.205	.179	.018	2.58	
DePue - White City	Bureau County-Mobil Chemical	8292	0	2	.383	.306	.162	.157	.021	2.79	
REGION 72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)											
Station 10	Massac County-TVA	8683	2	2	1.13	.61	.27	.20	.010	-	
Station 11	Massac County-TVA	8698	1	0	.70	.48	.14	.11	.009	-	
Station 16	Massac County-TVA	8722	1	0	.57	.47	.10	.09	.009	-	
Station 17	Massac County-TVA	8718	0	0	.37	.35	.10	.06	.007	-	
Station 18	Massac County-TVA	8705	3	1	.53	.51	.22	.12	.009	-	
Station 19	Massac County-TVA	8727	1	0	.62	.50	.11	.11	.010	-	
REGION 75 WEST CENTRAL ILLINOIS INTRASTATE											
New City	Sangamon County-Com Ed	7664	0	0	.214	.213	.057	.046	.009	-	
Cascade	Sangamon County-Com Ed	7858	0	0	.225	.217	.056	.055	.010	-	
Edinburg	Christian County-Com Ed	7734	0	0	.230	.153	.059	.045	.009	-	
Sangchris	Christian County-Com Ed	7682	0	0	.224	.136	.048	.047	.009	-	
Pawnee	Sangamon County-Com Ed	7745	0	0	.212	.182	.069	.039	.008	-	
Clark	Christian County-Com Ed	7766	0	0	.287	.228	.068	.052	.008	-	
Kincaid	Christian County-Com Ed	7721	0	0	.208	.186	.045	.041	.009	-	
Jeisyville	Christian County-Com Ed	7766	0	0	.334	.175	.064	.048	.009	-	
Clear Creek	Christian County-Com Ed	7622	0	0	.245	.190	.046	.042	.008	-	
Zenobia	Montgomery County-Com Ed	7648	0	0	.185	.173	.044	.037	.007	-	

**7.0
AMBIENT METALS
DATA**

7.0 AMBIENT METALS DATA

Airborne concentrations of various metals are of concern for several reasons: they are generally associated with particles in the respirable size range, many possess known toxic properties and they can act as catalysts in certain atmospheric reactions. Ambient concentrations of metals or metals compounds are derived from a number of sources including: natural, indigenous to soils; industrial, in particular the metals processing industry; and transportation, related to vehicular emissions and erosion of road surfaces.

The health effects of measured ambient concentrations of metals are not well defined at present and there currently exists no air quality standards for any metals or metals compounds. However, the USEPA has proposed a National Ambient Air Quality Standard for lead of $1.5 \mu\text{g}/\text{m}^3$ (calendar month average), with final establishment of this standard awaiting further review.

This section presents the results of statewide high-volume (hi-vol) sampling for ambient concentrations of iron (Fe), zinc (Zn), lead (Pb), copper (Cu), cadmium (Cd), arsenic (As), manganese (Mn), nickel (Ni) and chromium (Cr). The data has been summarized by Air Quality Control Region and is presented as an arithmetic average value in micrograms per cubic meter. It should be noted that some values are monthly composites, while others are the result of an analysis of individual hi-vol filters.

The highest concentrations of ambient metals were generally found to exist in industrial areas and, in particular, in areas impacted by emissions from iron and steel making operations. In addition, elevated levels of lead were measured in some areas characterized by high traffic density. Lowest concentrations of metals were found in non-urban areas where total suspended particulate measurements have been historically within the air quality standards.

In 1978, the metals sampling program will greatly expand in scope. Both the number of samples analyzed and the number of metals tested will be increased. This expanded program will allow for a more complete analysis of ambient metals concentrations in Illinois.

1977
AMBIENT METALS CONCENTRATIONS
(UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fe	Zn	Pb	Cu	Cd	As	Mn	Ni	Cr
65 BURLINGTON-KEOKUK INTERSTATE (ILL. - IND.)												
East Peoria	235 E. Washington	3	100	1.33	0.17	0.78	1.36		.003			
Galesburg	Main Street	7	59	0.78	0.05	0.31	0.08		.001			
Pekin	531 Court	4	101	1.58	0.17	0.37	0.13		.003			
Peoria	610 N. E. Jefferson	5	101	1.25	0.14	0.77	0.08		.004			
Peoria	2711 S. W. Jefferson	5	87	1.13	0.14	0.45	0.38		.003			
Peoria	1604 Detweiller	4	63	0.86	0.05	0.26	0.23		.002			
Peoria	Bradley University	5	74	1.22	0.13	0.39	0.09		.004			
66 EAST CENTRAL ILLINOIS INTRASTATE												
Bloomington	Washington and Madison	5	77	0.97	0.09	0.53	0.09		.001			
Champaign	2125 South First Street	3	77	0.74	0.06	0.22	0.24		.001			
67 METROPOLITAN CHICAGO INTERSTATE (ILL. - IND.)												
Addison	130 West Army Trail Road	7	59	0.69	0.08	0.53	0.16		.001			
Arlington Heights	33 S. Arlington Hts. Rd.	6 ^C	68	0.62	0.13	0.55	0.04			0.02	.002	.003
Bedford Park	6535 South Central	8	62	1.06	0.17	0.49	0.07		.003			
Bedford Park	6700 South 78th Avenue	8	80	1.20	0.13	0.90	0.10		.004			
Bensenville	Main and York Road	8	97	1.78	0.10	0.92	0.14		.002			
Bensenville	375 Meyer	7	66	0.97	0.09	0.55	0.07		.002			
Blue Island	12700 Sacramento	6 ^C	86	1.29	0.21	0.46	0.03			0.05	.001	.008
Bradley	610 East Liberty Street	5	75	1.07	0.08	0.50	0.11		.003			
Calumet City	755 Pulaski Road	6 ^C	75	1.67	0.25	0.39	0.05			0.12	.002	.008
Cary	1st St. & Three Oaks Road	6	39	0.45	0.02	0.20	0.07		.002			
Chicago:												
Addams School	10810 South Avenue "H"	8 ^C	134	6.50		0.34	0.94	.009	.008	0.30	.018	
Anthony Elementary	9800 South Torrence Avenue	8 ^C	99	3.31		0.37	0.75	.005	.006	0.16	.011	
Austin West High School	118 North Central	8 ^C	89	1.49		0.60	0.52	.002	.006	0.04	.008	
Calumet High School	8131 South May Street	8 ^C	77	0.80		0.35	0.45	.001	.004	0.03	.007	
Carver High School	801 East 133rd Place	8 ^C	94	2.49		0.39	0.58	.003	.004	0.10	.010	
Chicago Vocational H.S.	2100 East 87th Street	8 ^C	85	1.96		0.45	0.55	.002	.005	0.09	.008	
Clay Elementary School	13231 South Burley Avenue	S A M P L I N G D I S C O N T I N U E D										
Cooley Vocational H.S.	1225 North Sedgwick	8 ^C	105	2.21		0.43	0.71	.005	.004	0.07	.020	
Crib	68th St. & Lake Michigan	5 ^C	62	1.56		0.24	0.24	.002	.086	0.05	.009	
Edgewater	5358 North Ashland Avenue	7 ^C	73	1.41		0.61	0.43	.003	.005	0.05	.008	
Farr Dormitory	3300 South Michigan Avenue	2 ^C	99	2.15		0.45	0.58	.004	.008	0.08	.131	
Fenger Junior College	11220 South Wallace	8 ^C	82	1.83		0.55	0.42	.002	.004	0.06	.007	
G.S.A. Building	538 South Clark	8 ^C	86	1.86		0.53	0.63	.003	.004	0.06	.022	
Hale Elementary School	6140 South Melvina Avenue	8 ^C	100	1.31		0.54	0.59	.002	.005	0.04	.007	
Kelly High School	4136 South California Avenue	8 ^C	91	1.68		0.48	0.50	.004	.005	0.04	.011	
Kenwood High School	5015 Blackstone	8 ^C	79	1.36		0.45	0.38	.002	.004	0.04	.005	
Lakeview High School	4015 North Ashland Avenue	8 ^C	76	1.34		0.49	0.38	.002	.005	0.04	.011	
Lindblom High School	6130 South Wolcott Avenue	8 ^C	86	1.55		0.40	0.42	.002	.004	0.05	.009	
Logan Square	2940 W. Courtland Avenue	8 ^C	80	1.20		0.53	0.47	.002	.004	0.04	.011	
Medical Center	1947 West Polk	6	79	3.23	0.23	0.88	0.16	.002				
South Water Plant	3300 East Cheltenham Place	7 ^C	96	3.66		0.31	0.34	.003	.004	0.17	.015	
Steinmetz High School	3030 North Mobile Avenue	8 ^C	69	1.13		0.35	0.55	.002	.004	0.03	.009	
Stevenson Elementary Sch.	8010 South Kostner Avenue	8 ^C	81	1.25		0.44	0.55	.003	.004	0.04	.008	
Sullivan High School	6631 North Bosworth Avenue	8 ^C	60	0.80		0.51	1.02	.001	.004	0.03	.006	
Taft High School	5625 North Natoma Avenue	7 ^C	83	0.69		0.57	0.35	.002	.008	0.02	.006	
Von Steuben High School	5039 North Kimball Avenue	8 ^C	67	0.79		0.49	0.80	.002	.004	0.02	.007	
Washington High School	3500 East 114th Street	8 ^C	201	12.28		0.86	0.55	.011	.013	0.66	.034	

¹Metals values expressed as annual arithmetic mean.

²C denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977
AMBIENT METALS CONCENTRATIONS
 (UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fe	Zn	Pb	Cu	Cd	As	Mn	Ni	Cr
Chicago Heights	450 State Street	2	184	6.46	2.53	0.86	0.23					
Chicago Heights	Dixie Highway and 10th St.	6 ^c	64	0.94	0.22	0.30	0.03			0.04	.002	.006
Cicero		6 ^c	83	1.78	0.63	0.59	0.10			0.06	.010	.012
Crete	North and Elizabeth Streets	4	53	0.74	0.04	0.17	0.06		.001			
Crystal Lake	Franklin and Caroline Sts.	6	44	0.43	0.04	0.30	0.04		.002			
Des Plaines	1755 South Wolf Road	6 ^c	64	0.89	0.21	0.45	0.03			0.03	.002	.006
Elgin	1002 North Liberty	5	68	0.89	0.08	0.73	0.17		.002			
Elmhurst	118 Schiller	8	73	0.93	0.12	0.62	0.07		.002			
Evanston	1454 Elmwood	6	43	0.77	0.09	0.55	0.13		.001			
Flossmoor	999 Kedzie Avenue	6 ^c	61	1.50	0.15	0.26	0.04			0.03	.002	.004
Franklin Park	3400 North Rose Street	6 ^c	65	0.95	0.23	0.42	0.03			0.03	.002	.007
Glenview	1930 Prairie Street	5	88	1.66	0.12	0.82	0.25		.002			
Harvey	157th Lexington	6 ^c	77	1.78	0.27	0.55	0.05			0.07	.003	.011
Hillside	Wolf Road and Harrison	6 ^c	63	0.67	0.18	0.39	0.03			0.02	.001	.005
Island Lake	Island Lake Grade School	8	52	0.57	0.04	0.25	0.15		.003			
Joliet	5 East Van Buren	6	59	0.80	0.07	0.35	0.06		.002			
Joliet	Midland and Campbell	7	68	0.76	0.06	0.31	0.07		.002			
Joliet	1425 North Broadway	4	84	1.39	0.13	0.62	0.24		.004			
Joliet	Copperfield and Briggs	5	50	0.61	0.04	0.28	0.05		.001			
Joliet	Joliet & Benton Streets	6	121	2.14	0.31	0.73	0.11		.003			
Joliet	1216 Houboit Street	6	53	7.09	0.07	0.27	0.07		.003			
Joliet	4111 County Health Dept.	6	84	0.94	0.12	0.36	0.11		.002			
Lake Bluff	121 East Sheridan Place	8	45	0.63	0.79	0.30	0.10		.001			
Lockport	5th and Madison	7	59	0.62	0.07	0.28	0.09		.003			
McCook	50th and Glencoe	5	102	1.20	0.49	0.89	0.13		.004			
McCook	Route 66 and Lawndale	4	83	1.12	0.17	0.64	0.09		.002			
Midlothian	15202 Crawford Avenue	6 ^c	54	0.58	0.12	0.25	0.21			0.02	.001	.004
Mokena	10940 Front Street	7	64	0.85	0.09	0.30	0.23		.002			
Monroe	432 East Main Street	7	49	0.72	0.04	0.20	0.08		.002			
Morton Grove	9111 Waukegan	6 ^c	65	0.65	0.15	0.60	0.09			0.02	.001	.004
Naperville	175 Jackson Street	7	62	0.73	0.04	0.44	0.08		.002			
Niles	8955 Greenwood Avenue	6 ^c	62	0.77	0.23	0.47	0.04			0.02	.002	.006
North Chicago	1850 Lewis Avenue	2	34	0.34	0.05	0.64	0.07		.002			
Oak Park	834 Lake Street	6 ^c	57	0.50	0.14	0.36	0.30			0.02	.003	.003
Orland Park	133rd and LaGrange Road	6 ^c	58	0.86	0.18	0.31	0.03			0.03	.002	.007
Palatine	1000 Quentin Road	6 ^c	56	0.28	0.17	0.22	0.01			0.01	.002	.003
Park Forest	100 Park Avenue	6 ^c	53	0.54	0.12	0.21	0.50			0.02	.002	.003
Plainfield	1005 Eastern	5	55	0.44	0.03	0.20	0.10		.001			
Plano	Main Street	3	46	0.52	0.21	0.20	0.15		.002			
River Forest	Lathrop and Oak Avenue	6 ^c	61	0.91	0.18	0.53	0.03			0.03	.003	.006
Rockdale	Well #2 Pump Station	8	86	1.13	0.08	0.37	0.16		.002			
Romeoville	Naperville Road	6	59	0.75	0.06	0.27	0.17		.001			
Skokie	7701 Lincoln Avenue	8	69	1.43	0.76	0.95	0.10		.002			
Skokie	4401 Demster	8	70	1.31	0.12	0.95	0.12		.002			
Summit	60th and 74th Avenue	5 ^c	87	1.25	0.24	0.59	0.04			0.04	.005	.010
Waukegan	106 Utica	8	55	1.13	0.22	0.59	0.17		.002			
Waukegan	Golf and Jackson	7	50	0.92	0.17	0.44	0.07		.002			
Waukegan	2200 Brookside	8	54	0.75	0.14	0.53	0.07		.002			
West Chicago	DuPage County Airport	7	62	0.73	0.04	0.44	0.08		.002			
West Chicago	128 West McConnell Street	7	61	0.99	0.04	0.33	0.13		.001			
Wheaton	201 Reber Street	8	60	0.80	0.06	0.39	0.13		.002			
Wilmette	9th Street and Central Ave.	6 ^c	50	0.60	0.13	0.38	0.02			0.02	.003	.005
Wilmington	South Joliet Street	7	60	0.67	0.04	0.17	0.06		.002			
Winnetka	112 Willow Road	8	42	0.63	0.06	0.41	0.13		.002			

¹ Metals values expressed as annual arithmetic mean.

² ^c denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³ For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977
AMBIENT METALS CONCENTRATIONS
 (UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fe	Zn	Pb	Cu	Cd	As	Mn	Ni	Cr
68 METROPOLITAN DUBUQUE INTERSTATE (ILL. - WIS. - IOWA)												
Galena	311 South Main Street	5	89	1.64	0.13	0.45	0.04		.003			
69 METROPOLITAN QUAD CITIES INTERSTATE (ILL. - MO.)												
East Moline	915 16th Avenue	7	75	0.96	0.05	0.44	0.10		.001			
Milan	125 West 2nd Avenue	7	93	0.85	0.05	0.48	0.14		.002			
Moline	619 16th Street	7	61	0.71	0.04	0.37	0.16		.002			
Moline	3600 23rd Avenue	7	58	0.62	0.06	0.28	0.06		.001			
Rock Falls	101 12th Avenue	6	64	1.74	0.35	0.35	0.11		.003			
Rock Island	1528 3rd Avenue	6	80	0.91	0.05	0.68	0.09		.001			
Rock Island	1400 25th Avenue	7	56	0.55	0.04	0.26	0.09		.001			
Sterling	110 West 5th Street	3	80	2.15	0.66	0.80	0.15		.004			
70 METROPOLITAN ST. LOUIS INTERSTATE (ILL. - MO.)												
Alton	103 East 3rd Street	8	105	1.53	0.28	1.15	0.27		.006			
Alton	2708 Edwards	7	106	2.46	0.72	0.99	0.23		.006			
Belleville	101 South Illinois	3	110	1.76	0.22	1.39	0.14		.002			
Cahokia State Park	Business Route 40	8	109	1.65	0.21	0.70	0.20		.004			
Collinsville	115A West Main	8	95	1.23	0.14	0.55	0.22		.002			
Columbia	208 South Rapp	6	109	1.11	0.09	0.38	0.18		.003			
East St. Louis	7 Collinsville Avenue	3	111	2.46	0.79	0.79	0.31		.008			
Edwardsville	Main and Purcell	5	77	0.96	0.14	0.44	0.12		.002			
Granite City	2000 Edison Avenue	8	128	6.14	0.53	1.09	0.24		.013			
Granite City	23rd and Madison	7	151	9.78	1.67	1.09	0.25		.010			
Granite City	3210 East 23rd	8	116	2.89	0.70	0.70	0.21		.006			
Granite City	2001 East 20th	7	198	0.32	1.10	0.76	0.18		.009			
Granite City	15th and Madison	7	185	4.48	0.47	2.08	0.18		.013			
Granite City	Roosevelt and Rock Road	8	147	4.36	0.35	1.02	0.24		.010			
Granite City	2040 Johnson Road	8	110	3.03	0.26	0.82	0.29		.006			
Granite City	East 23rd and Nameoki	7	111	2.80	0.25	1.03	0.23		.007			
Granite City	Norfolk and Western	6	145	6.76	0.33	0.41	0.15		.008			
Wood River	54 Walcott	8	162	1.32	0.85	0.96	0.33		.009			
71 NORTH CENTRAL ILLINOIS INTRASTATE												
DePue	Non-Responsive	6	55	0.71	0.27	0.23	0.41		.002			
Hennepin		7	63	0.86	0.07	0.26	0.18		.003			
Oglesby		3	128	2.21	0.07	0.12	0.18					
Ottawa		5	58	0.63	0.06	0.21	0.06		.003			
72 PADUCAH-CAIRO INTERSTATE (ILL. - KY.)												
Metropolis	Massac County Hospital	2	181	2.12	0.15	0.53	0.25		.004			
73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILL. - WIS.)												
DeKalb	200 South 4th Street	6	51	0.63	0.06	0.37	0.09		.002			
Rockford	2525 Ohio	5	44	0.59	0.06	0.40	0.07		.001			
Rockford	126 South 1st Street	5	57	1.09	0.18	0.49	0.07		.002			

¹Metals values expressed as annual arithmetic mean.

²C denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977
AMBIENT METALS CONCENTRATIONS
 (UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fe	Zn	Pb	Cu	Cd	As	Mn	Ni	Cr
74 SOUTHEAST ILLINOIS INTRASTATE												
Carbondale	306 West Main Street	3	84	0.41	0.10	0.51	0.11		.002			
Effingham	1015 South Willow	3	86	1.00	0.08	0.43	0.25		.001			
Marian	2209 West Main Street	7	83	0.69	0.04	0.26	0.17		.002			
Mt. Vernon	601 North 18th Street	7	70	0.84	0.05	0.26	0.07		.001			
75 WEST CENTRAL ILLINOIS INTRASTATE												
Decatur	22nd and Geddes	6	140	1.71	0.13	0.57	0.20		.003			
Decatur	600 East Garfield	4	93	0.96	0.08	0.58	0.14		.002			
Decatur	Jasper and Orchard	6	116	2.16	0.09	0.66	0.19		.003			
Decatur	750 East Lake Shore Drive	4	117	1.03	0.09	0.60	0.19		.003			
Decatur	29th and Locust	1	155	1.93	0.12	1.17	0.10					
Decatur	Condit Street	4	138	1.91	0.12	0.35	0.20		.003			
Decatur	24th and Locust	2	184	1.33	0.14	0.43	0.26		.002			
Petersburg	7th and Jackson Streets	5	84	1.09	0.08	0.42	0.18		.003			
Quincy	9th and Vermont	4	68	1.27	0.08	0.53	0.18		.001			
Quincy	Sewage Plant	5	85	1.09	0.12	0.83	0.25		.002			
Springfield	224 West Adams	5	94	1.06	0.15	0.43	0.24		.003			

¹Metals values expressed as annual arithmetic mean.

²C denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those analyzed for metals.

APPENDIX A

STATISTICAL METHODS

I. LOG-NORMAL STATISTICS

The following is a list of symbols used in the various formulas:

n - the total number of samples used

x_i - the concentration of each individual sample

\ln - the natural logarithm function (log to base e)

\exp - the exponential function (inverse of the \ln function)

\sum_i - the total summation of the appropriate values

\bar{x} - arithmetic mean

\bar{x}_g - geometric mean

S_g - standard geometric deviation

Arithmetic Mean:

$$\bar{x} = \frac{1}{n} \sum_i x_i$$

Geometric Mean:

$$\bar{x}_g = \exp \left(\frac{1}{n} \sum_i \ln x_i \right)$$

The arithmetic mean is always equal to or greater than the geometric mean.

Standard Geometric Deviation:

$$S_g = \exp \left[\frac{1}{n-1} \left(\sum_i (\ln x_i)^2 - \frac{1}{n} \left(\sum_i \ln x_i \right)^2 \right) \right]^{1/2}$$

Arithmetic Mean to Geometric Mean:

The following relationship exists between the arithmetic mean, geometric mean, and standard geometric deviation. By knowing two of the values, the third can be calculated.

$$\bar{x}_g = \frac{\bar{X}}{\exp (0.5 (\ln S_g)^2)}$$

Maximum and Second High Predicted 24-Hour Concentrations:

For a geometric mean \bar{x}_g and standard geometric deviation S_g , based on a log-normal distribution of pollutants collected throughout the year, the maximum and 2nd high predicted for the year out of a total of 365 possible data values is given by:

$$C_{\max} = \bar{x}_g (S_g)^{2.94}$$

$$C_{2\text{nd}} = \bar{x}_g (S_g)^{2.63}$$

Example 1: For $\bar{x}_g = 70 \text{ } \mu\text{g}/\text{m}^3$ and $S_g = 1.5$

$$C_{\max} = 70 \text{ } \mu\text{g}/\text{m}^3 (1.5)^{2.92} = 231 \text{ } \mu\text{g}/\text{m}^3$$

$$C_{2\text{nd}} = 70 \text{ } \mu\text{g}/\text{m}^3 (1.5)^{2.63} = 203 \text{ } \mu\text{g}/\text{m}^3$$

II. DANIEL'S TEST FOR TRENDS USING SPEARMAN RANK CORRELATION COEFFICIENT

The test statistic, ρ , is given by:

$$\rho = 1 - \frac{6 T}{n (n^2 - 1)}$$

where

$$T = \sum_i (R(x_i) - i)^2$$

n is the number of years in the trend.

$R(x_i)$ is the rank of the concentration x_i , 1 being the lowest concentration.

i is the order of the year, 1 being the first year.

Compare $|\rho|$ with the Spearman Statistic, W_p , as given in the table below for the 90% confidence level. The interpretation of this significance level is that if a trend does not exist, 10 out of 100 times this test will falsely predict a trend.

TABLE

Number of Trend Years	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Wp, 90% confidence level	.8000	.8000	.7714	.6786	.6190	.5855	.5515

The trend is determined to exist if $|\rho| > W_p$

For $\rho > 0$ then the trend is upward

For $\rho < 0$ then the trend is downward

To illustrate the use of this procedure, two examples are given.

Example 2:

<u>Year</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Data (x_i)	112	104	85	78	81	72	66
R (x_i)	7	6	5	3	4	2	1
i	1	2	3	4	5	6	7

$$n = 7$$

$$T = (7-1)^2 + (6-2)^2 + (5-3)^2 + (3-4)^2 + (4-5)^2 + (2-6)^2 + (1-7)^2 = 110$$

$$\rho = 1 - \frac{6(110)}{7(7^2 + 1)} = -.8857$$

$|\rho| = .8857$ which is greater than W_p for $n = 7$ from the Table, thus the trend is established. Since ρ is negative, the trend is downward.

Example 3:

<u>Year</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Data (x_i)	91	80	66	97	93	92	85
R (x_i)	4	2	1	7	6	5	3
i	1	2	3	4	5	6	7

$$n = 7$$

$$T = (4-1)^2 + (2-2)^2 + (1-3)^2 + (7-4)^2 + (6-5)^2 + (5-6)^2 + (3-7)^2 = 40$$

$$\rho = 1 - \frac{6(40)}{7(7^2 + 1)} = .3143$$

$|\rho| = .3143$ which is less than W_p for $n = 7$ from the Table. Thus no trend can be determined.

III. PRECISION OF NONCONTINUOUS SAMPLING

The following formulas are from Hunt (1972) and provide the difference between the geometric mean and the upper and lower confidence limits as a fraction of the geometric mean.

Lower limit fraction

$$m_1 = 1 - \exp \left[-t_{.025} \frac{1n \text{ Sg}}{n^{1/2}} \left(1 - \frac{n}{N} \right) \right]^{1/2}$$

Upper limit fraction

$$m_2 = 1 - \exp \left[t_{.025} \frac{1n \text{ Sg}}{n^{1/2}} \left(1 - \frac{n}{N} \right) \right]^{1/2} - 1$$

Sg is the geometric standard deviation

n is the number of samples taken during the year

N is the total possible number of samples (for 1 year, N = 365)

t_{.025} is the "t" statistic for n-1 degrees of freedom at the 95% confidence level

The lower confidence limit is obtained by multiplying the geometric mean by m₁ and subtracting the result from the geometric mean. Likewise the upper confidence limit is obtained by multiplying the geometric mean by m₂ and adding the result to the geometric mean.

Example 4: Geometric mean = 66

Geometric standard deviation = 1.67

Number of samples n = 61

"t" statistic for 60 degrees of freedom t_{.025} = 2.000

$$m_1 = 1 - \exp \left[-2.000 \frac{.513}{61^{1/2}} \left(1 - \frac{61}{365} \right) \right]^{1/2} = .113$$

$$m_2 = \exp \left[2.000 \frac{.513}{61^{1/2}} \left(1 - \frac{61}{365} \right) \right]^{1/2} - 1 = .127$$

$$\text{lower limit} = 66 - (.133) 66 = 59$$

$$\text{upper limit} = 66 + (.127) 66 = 74$$

Thus, because sampling occurred only once every six days, the true annual mean is between 59 $\mu\text{g}/\text{m}^3$ and 74 $\mu\text{g}/\text{m}^3$ at the 95% confidence level.

APPENDIX B

REFERENCES

Monitoring and Data Analysis Division, Office of Air
Quality Planning and Standards
U.S. EPA, Research Triangle Park, North Carolina 27711

OAQPS 1.2 - 008 - Guidelines for the Interpretation of Air Quality
Standards

1.2 - 014 - Guidelines for the Evaluation of Air Quality Trends

1.2 - 015 - Guidelines for the Evaluation of Air Quality Data

Selected Papers and Monographs

Curran, Thomas C. and William F. Hunt, Jr.: "Interpretation of Air Quality Data with Respect to the National Ambient Air Quality Standards", presented at the Air Pollution Control Association (APCA) annual meeting, June, 1974, Denver, Colorado.

Curren, Thomas C. and Frank, Neil H.: "Assessing the Validity of the Lognormal Model when Predicting Maximum Air Pollution Concentrations", presented at APCA annual meeting, June, 1975, Boston, Massachusetts.

Hemon, W. C. L., Haines, G. F., Jr. and Ide, H. M.: "Determination of Haze and Smoke Concentrations by Filter Paper Samplers", J. Air Pollution Control Association, Vol. 3, pp. 22-28, 1953.

Hunt, W. F., Jr.: "The Precision Associated with the Sampling Frequency of Lognormally Distributed Air Pollution Measurements", Journal of Air Pollution Control Association, 22, 687-691, (1972).

Larsen, Ralph: "A Mathematical Model for Relating Air Quality Measurements to Air Quality Standards", November, 1971, AP-89, Office of Air Programs, EPA, Research Triangle Park, N.C. 27711.

Larsen, Ralph I.: "An Air Quality Data Analysis System for Interrelating Effects, Standards and Needed Source Reductions", Journal of the Air Pollution Control Association, 23, 933-940, (1973).

Larsen, Ralph I.: "An Air Quality Data Analysis System for Interrelating Effects, Standards and Needed Source Reductions - Part 2", Journal of the Air Pollution Control Association, 24, 551-558, (1974).

Health and Welfare Effects of Air Pollutants

Office of Air Programs, EPA, Research Triangle Park, N.C. 27711

Air Quality Criteria for Particulate Matter, AP-49
Air Quality Criteria for Sulfur Oxides, AP-50
Air Quality Criteria for Carbon Monoxide, AP-62
Air Quality Criteria for Photochemical Oxidants, AP-63
Air Quality Criteria for Hydrocarbons, AP-64
Air Quality Criteria for Nitrogen Oxides, AP-84

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